

DOCUMENT TYPE DEFINITIONS FOR SERIAL PUBLICATIONS

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2 DECEMBER 1996



Elsevier Science

Amsterdam–Lausanne–New York–Oxford–Shannon–Tokyo–Cambridge

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The figures in appendix H were prepared especially for this documentation by Coen Hofmann, Alfred Smit and Sebastian Rahtz. The present document replaces “Documentation of the Elsevier Science Article DTD” of 1 November 1995, by N.A.F.M. Poppelier, H. van der Togt and F.K. Veldmeijer. This earlier document is therefore obsolete. Grey vertical bars in the margin indicate changes to the text with respect to the previous version. Small grey squares in the margin indicate deletions.

Contents

1	Introduction 3
1.1	<i>SGML – what and why? 3</i>
2	The document type definition 4
2.1	<i>Objectives 4</i>
2.2	<i>How to read this description 4</i>
2.3	<i>Article structure versus text structure 4</i>
2.4	<i>Embedded and sequential structure 5</i>
2.5	<i>Optional, mandatory and absent tags 5</i>
2.6	<i>Optional, mandatory and repeatable elements 5</i>
2.7	<i>Attributes and cross-reference 6</i>
3	Article structure 7
3.1	<i>Copyright information 7</i>
3.2	<i>Document header 9</i>
3.3	<i>Document topic 9</i>
3.4	<i>Front matter 9</i>
3.5	<i>Body 16</i>
3.6	<i>Back matter 17</i>
4	Index structure 31
4.1	<i>Indexes as separate documents 31</i>
4.2	<i>The model 31</i>
4.3	<i>Index 32</i>
4.4	<i>Example 33</i>
5	Glossary 35
5.1	<i>Glossaries as separate documents 35</i>
5.2	<i>Glossary 36</i>
5.3	<i>Example 36</i>
6	Text structure 38
6.1	<i>Footnote 38</i>
6.2	<i>Anchor 39</i>
6.3	<i>Displayed quotation 39</i>
6.4	<i>Enunciations 39</i>
6.5	<i>Cross-reference 39</i>
6.6	<i>Link 40</i>
6.7	<i>Intra-document reference 40</i>
6.8	<i>Inter-document reference 40</i>
6.9	<i>List 41</i>
6.10	<i>Definition list 42</i>
6.11	<i>Table 42</i>
6.12	<i>Inline figure 45</i>
6.13	<i>Figure 45</i>
6.14	<i>Scheme 46</i>
6.15	<i>Plate 46</i>
6.16	<i>Text-box 46</i>
6.17	<i>Unprinted item 46</i>
6.18	<i>Formula 47</i>
6.19	<i>Elements for built-up text 47</i>
6.20	<i>Font changes 51</i>

Appendices 51

- A **Future enhancements 53**
- B **Entity management 54**
- C **SGML declaration 55**
- D **Document type definition for articles 57**
- E **Document type definition for indexes 65**
- F **Document type definition for glossaries 69**
- G **Changes with respect to previous version 72**
- H **Character set 76**

Bibliography 120

Index 121

Chapter 1

Introduction

The purpose of this document is not to give a detailed explanation of the Standard Generalized Markup Language (SGML) or to explain the basics of writing a Document Type Definition (DTD). The main purpose is to provide a readable description of the Elsevier Science DTDs for journals, i.e. serial publications. This includes the article DTD version 4.0.0, the index DTD version 1.0.0, and the glossary DTD version 1.0.0.

However, on the understanding that there are those who would like to comment, but do not feel the need for an in-depth tutorial on the subject, the following section should put this document into context.

1.1 SGML – what and why?

1.1.1 What

An explanation of what SGML is can be found in [1]. We will summarize briefly here. In order to separate structure and presentation one applies the concept of generic markup: generic codes (or tags) are placed around most – or all – elements in a document. These elements could be a paragraph, a title, an abstract etc. The tags usually indicate the structure of the document. They do not indicate the style or format of the document, such as fonts, column widths etc. For each different style a style sheet is required to translate the logical structure into a presentation on paper, for example. The set of tags and their mutual relations comprise the ‘generic markup language’.

1.1.2 Why

SGML is a natural evolution of generic markup: it formalizes the structure and representation of the document, by combining the notion of generic markup with the observation that the logical structure of a document can be expressed in a tree-like structure. ‘SGML has the flexibility to define an infinite set of generic markup languages. [...] An SGML markup language defines the possible hierarchical structures of documents in [a] class’ [1].

By using SGML to structure documents, they can be exchanged between many parties. Furthermore, the tags can remain constant and device-independent, since they define generic markup and do not drive any specific application. The SGML tags can readily be converted to typesetting codes for paper printing, or to field codes for database creation, or to any other codes for numerous applications.

Chapter 2

The document type definition

The purpose of a DTD is to describe and name the tags that will identify the different elements in a document and their relationships. In other words, a DTD is more than a list of tags: it is a grammar of a particular class of documents. In particular, the purpose of the Elsevier Science DTDs for journals is to cover all publication items published in journals produced by Elsevier Science. It is important therefore that these DTDs identify every type of structure within such documents. The reason for this is that pieces of information, e.g. an address, that need to be extracted from a document at a later stage for a certain product or service, must be tagged in the document.

2.1 Objectives

SGML plays an essential role in computer-aided production in the process of scientific publishing. A DTD defines the tagging of articles: it describes which elements an article must contain, which it may optionally contain, whether elements may occur only once or may be repeated, and how elements are tagged. The DTDs described here will serve as a standard for tagging of all publication items published in journals. The use of a fully functional, standard DTD is essential for the achievement of the objectives of Elsevier Science.

This report describes the DTDs that have been developed for full-length articles, indexes, and glossaries. The article DTD defines the structure of the typical article published in research journals or proceedings. Other possible constituents of a journal issue, such as errata, editorials, book reviews and review articles, are now also included in the structure that is defined by the article DTD. Related DTDs exist for subject indexes and glossaries.

Whenever the need for changes in the DTDs arises in these environments, the requests for changes will be examined and, when approved, implemented.

To enhance readability of this documentation of the DTDs, an index of all elements and attributes is added at the end. For further reading on SGML, please refer to the bibliography.

2.2 How to read this description

It is assumed that the reader has a basic knowledge of SGML, at least to the level that the reader knows that

- SGML tags are used for marking text structure;
- a document type definition (DTD) is used for defining text structure;
- presentation rules, for example in the form of a style sheet, are used to translate the structure of a document into some form of presentation, for example into instructions for a typesetting system.

For further information please refer to [1, 2].

2.3 Article structure versus text structure

This documentation is split into two major parts: a part on the structure of the document types that occur in journals (article, index, glossary), and a part on text structure. For example: in the body of an article, text is structured into paragraphs and sections. The structuring of an article in terms of elements such as author, title, sections and paragraphs, bibliography and appendix is discussed in the chapter on article structure (chapter 3). Figures, tables, equations and citations contain text, the constituents of which are discussed in the chapter on text structure (chapter 6).

2.4 Embedded and sequential structure

In any DTD structure is defined in terms of sequence and embedding. For example an article consists of the elements copyright information, document header, document topic, front matter, body matter and back matter, which must appear in this order. Each of these structural elements may be further subdivided, and these subdivisions subdivided again, and so on. For example: a constituent part of the front matter is the author group, a constituent part of author group is author name, a constituent part of author name is first name, and so on. In other words: first name is embedded in author, author in author group and author group in front matter.

In the chapters on document and text structure, the sequential order and the embedded structure of the DTDs are reflected in the level of the section numbers. Elements in a DTD at the same level, such as front matter, body matter and back matter are assigned section numbers at the same level, e.g. 3.1, 3.2 and 3.3. Embedded elements are assigned section numbers at a deeper level, e.g. 3.4, 3.4.10, 3.4.10.1.

In some cases where article elements are at the same level of embedding, the order of the elements may vary. When this is the case, it is explicitly stated, for example in the author element, where first name and surname can appear in any order (see section 3.4.5.2).

2.5 Optional, mandatory and absent tags

For each element, opening and closing tags are given. It is also specified whether the tags are mandatory or optional. If a tag is mandatory, it must be present in the document for every instance of that particular element. This does not mean that the element has to be present in a document.

In cases where an element at one level follows an element at the same level, the closing tag will often be optional. This is because the new opening tag automatically implies a closing tag for the previous element, e.g. the front matter ends where the body of the article begins. In such cases the opening tags are mandatory, whereas the closing tag is optional.

In cases where it is not obvious where an element finishes, a closing tag would be mandatory.

In some cases, the closing tag does not exist at all, and the element is called an ‘empty’ element. This would occur, for instance, where tags do not enclose content (text), but are merely used for establishing a cross-reference.

2.6 Optional, mandatory and repeatable elements

For each element, a DTD specifies whether the element is an optional or mandatory part of the document and whether it may be repeated in its ‘parent’ element, i.e. the immediately surrounding element.

An element that is optional, may be absent or present in its parent element. An example is the dedication element in the front matter (see section 3.4).

An element that is mandatory, must be present in its parent element: if it is not, then its parent element is not valid according to the proposed DTD. An example is front matter (see 3.4): this is considered to be an essential element of the typical scientific article.

Note that in cases where a mandatory element has a parent element that is optional, the element itself is only mandatory if its parent element is present. An example is the element country in the parent element affiliation: country is mandatory in affiliation (see 3.4.5.5, but affiliation is an optional constituent of an author group (see 3.4.5). Therefore, if affiliation is present, country must be present, but affiliation need not be present in an article.

A DTD also specifies if an element can appear more than once within its parent element, irrespective of whether it is optional or mandatory.

Examples of elements that can be repeated are:

- affiliation in author group (section 3.4.5);
- author in author group (section 3.4.5);
- paragraph in body matter (section 3.6).

Examples of elements that cannot be repeated are:

- front matter in article (chapter 3);
- dedication in front matter (section 3.4).

In most cases this is obvious: there can be more than one author, but there cannot be more than one front matter.

It should be noted that when a DTD specifies that an element cannot be repeated within its parent element, this does not necessarily mean that the element cannot occur elsewhere in the document. This could occur if the parent element is repeatable. For instance, whereas the sub-title element within the parent element ‘article title’ cannot be repeated, article title itself can. Consequently, sub-titles can occur more than once in an article, but each one of them must correspond to an article title, and per article title not more than one sub-title is allowed.

2.7 Attributes and cross-reference

Attributes in SGML are used for specifying properties of the document elements, in addition to the content of those elements. For each element, attributes are listed if applicable. For each attribute, the full name is listed, the proposed code is given and it is specified whether the attribute is optional or mandatory for this particular element. Where considered relevant, the meaning of the attribute is explained briefly.

Attributes are also used to create links for cross-referencing. By using the attribute `id` together with a unique name for its value, an element can be identified for future referencing in the text. By using a special cross-referencing element, `cross-ref`, with the same unique identifier `id`, the connection can be made.

An example may help to clarify this. Assuming there is a bibliographic reference (the target) the author wishes to refer to in the text, the reference would be “tagged” as follows (in this example indentation, line breaks and spacing are used in these examples for clarity only – in actual documents these will be absent).

```
<bib id="ref2">
  <bb>
    <contribution>
      <authors>
        <author>
          <fnm>E.<snm>van Herwijnen
        <title>Practical SGML
      <host>
        <book>
          <edition>2nd (revised) edition
          <date>1994
          <publisher>
            <name>Kluwer Academic Publishers
            <location>Dordrecht
```

where `ref2` is a unique identifier for that particular reference (for more information please read section 6.5). Now, in the body of the article, the author can use the cross-referencing element (`<cross-ref>`) and add the unique identifier for that particular reference, i.e.

```
<cross-ref refid="ref2">[2]</cross-ref>.
```

The link is then established. For example:

... as Van Herwijnen describes in [2] ...

Chapter 3

Article structure

In this chapter we will describe the main structure of the document type definition for full-length articles. Since it is impossible to give a complete, in-depth description of the structure of a full-length article in normal English, i.e. without making use of SGML, the document type definition – see appendix D – remains the final reference. A semi-graphical representation of the overall structure of a full-length article, the type of document described by this DTD, is given in figure 3.1.

The article as a whole is identified by the following opening and closing tags:

Opening tag: `<art>`, mandatory.

Closing tag: `</art>`, optional.

At the highest level, an article can be split into the following parts: copyright information, document head, document topic, front matter, body matter and back matter. Only the front matter is mandatory. In whatever combination they occur, they must always appear in this order.

For an example of a complete front matter, please see page 11.

The `art` element has the following attributes: `version`, `jid`, `aid`, `pii`, `docsubty`, `refers-to` and `language`.

The attribute `version` denotes the version of the DTD that has to be used with the article in question. This is a fixed attribute, and its value should be `4.0.0`.

The attributes `jid` and `aid` are the journal identifier and article identifier respectively. Both are required attributes.

The `pii` attribute is a free-text attribute (CDATA), and contains the PII. The PII is the Publisher Item Identifier, which uniquely identifies a publication item.

The attribute `docsubty` replaces the ‘publication item type’ of earlier versions, and can have the following values: `abs` (abstract), `add` (addendum), `adv` (advertisement), `ann` (announcement), `cal` (calendar), `cnf` (conference), `cor` (correspondence), `dis` (discussion), `edi` (editorial), `err` (erratum), `fla` (full-length article), `lit` (literature alert), `mis` (miscellaneous), `nws` (news), `pnt` (patent), `prp` (personal report), `prv` (product review), `pub` (publisher’s note), `rev` (review article), `sco` (short communication), `ssu` (short survey).

The `refers-to` attribute is another free-text attribute, and contains the PII of the parent document, i.e. the document the present one refers to. This is mostly used for errata and correspondence items.

The last attribute, `language`, specifies the main language of the document, by means of a two-letter language code taken from International Standard ISO 639:1988; the recognized codes are `en` (English, default), `fr` (French), `de` (German), `es` (Spanish), `pt` (Portuguese) and `ru` (Russian).

3.1 Copyright information

Opening tag: `<copyright>`, mandatory.

Closing tag: `</copyright>`, optional.

The content of `copyright` is the copyright holder, if any. Its mandatory attribute `yr` is the copyright year. This usually is the year of first publication.

The mandatory attribute `type` indicates in which way copyright has been transferred. This is shown in the following table, where *XX* is one of ‘B.V.’, ‘Inc.’, ‘Ltd.’, ‘S.A.’, etc., and the status refers to the copyright status from the official table of Copyright Notices [12].

status	type	copyright holder
1	unknown	empty
2, 8	full-transfer	Elsevier Science <i>XX</i>
3	us-gov	empty
4	crown	empty
5	limited-transfer	Elsevier Science <i>XX</i>
6	other	name of author or employer
7	no-transfer	empty
9	society	name of society

Sample output for each status is given below. The text marked with an underline is taken from the `copyright` element, while the remaining text has to be generated.

status	typical output
1	Copyright © <u>1997</u> Published by Elsevier Science <i>XX</i> All rights reserved.
2, 8	Copyright © <u>1997 Elsevier Science <i>XX</i></u> All rights reserved.
3	Published by Elsevier Science <i>XX</i> .
4	Crown copyright © <u>1997</u> Published by Elsevier Science <i>XX</i> .
5	Copyright © <u>1997 Elsevier Science <i>XX</i></u> All rights reserved.
6	Copyright © <u>1997 S. Yamamoto.</u> Published by Elsevier Science <i>XX</i> .
7	not applicable
9	Copyright © <u>1997 IFIP.</u> Published by Elsevier Science <i>XX</i> .

3.2 Document header

Opening tag: `<dochead>`, mandatory.

Closing tag: `</dochead>`, optional.

The `dochead` element contains the (optional) header, in earlier versions called the ‘article type’, that is usually printed above the title of the document, e.g. “Rapid communication”. The contents of this element is unstructured text.

3.3 Document topic

Opening tag: `<doctopic>`, mandatory.

Closing tag: `</doctopic>`, optional.

If the document appears in a sectionalized journal, the value of the element `doctopic` is the name of the section of the journal in which this document goes, e.g. “Particles and fields”. In these journals the presentation style may choose not to print the document topic, but it can be reused for example to produce the table of contents. The contents of this element is unstructured text.

3.4 Front matter

Opening tag: `<fm>`, mandatory.

Closing tag: `</fm>`, optional.

Front matter consists of the following elements (in this order):

- title footnote (optional)
- article title (optional, repeatable)
- presented by (optional)
- dedication (optional)
- author group (optional, repeatable)
- received date (optional)
- revised date (optional, repeatable)
- accepted date (optional)
- miscellaneous information (optional)
- abstract (optional, repeatable)
- keyword group (optional, repeatable)
- nomenclature (optional)

An example of the start of an article marked up in SGML is given in figure 3.2. This example could be presented as shown in figure 3.3.

3.4.1 Title footnote

Opening tag: `<at1fn>`, mandatory.

Closing tag: `</at1fn>`, optional.

The title footnote is a special footnote attached to the article title. It should be distinguished from footnotes contained in the title. The title footnote consists of text.¹

3.4.2 Article title

Opening tag: `<at1>`, mandatory.

Closing tag: `</at1>`, optional.

The element article title consists of text and an optional sub-element sub-title. The order of appearance of these elements is fixed. The start tag `<at1>` has one optional attribute, `language`, which defines the language of the title, if this is different from the main language of the document; its values are the two-letter language codes explained above.

3.4.2.1 Subtitle

Opening tag: `<sbt>`, mandatory.

Closing tag: `</sbt>`, optional.

Contents: text.

3.4.3 Presented by

Opening tag: `<prs>`, mandatory.

Closing tag: `</prs>`, optional.

Contents: text (the name of the presenter of this article).

3.4.4 Dedication

Opening tag: `<ded>`, mandatory.

Closing tag: `</ded>`, optional.

Contents: text (the dedicatory text of this article).

1. In descriptions of the contents of elements the term 'text' stands for contents of the kind described in chapter 6. In other words, an element with content 'text' has no further sub-division into smaller *structural* elements.

```

<!doctype art "-//ES/DTD Elsevier Science article DTD v4.0.0//EN">
<art version="4.0.0" jid="APCATA" aid="2937" docsubty="FLA" pii="S0926860X94002127">
<dochead>Research report
<fm>
<atl>Decomposition of organic hydroperoxides on cation exchangers
<aug>
<au><fnm>P.<snm>Fejes
<cor>Corresponding author.</cor>
<aff>Babes-Bolyai University, Faculty of Economic Sciences,
Laboratory of Chemical Technology,
R-3400 <cty>Cluj-Napoca (Kolozsvar)</cty>,
<cny>Romania</cny>
<re day=4 mo=7 yr=1994>
<abs>
<p>The acid catalyzed decomposition of p-tert-butylcumene
hydroperoxide results in acetone and p-tert-butylphenol as the main
products. This paper deals with the experimental results obtained on
strongly acidic activated cation exchanger resins. ...
<kwdg>
<kwd>Acidity</kwd>
<kwd>Cation exchangers</kwd>
<kwd>Organic peroxides decomposition</kwd>

```

Figure 3.2: Example of the beginning of an article marked up in SGML.

Research report

Decomposition of organic hydroperoxides on cation exchangers

P. Fejes*

Babes-Bolyai University, Faculty of Economic Sciences, Laboratory of Chemical Technology, R-3400 Cluj-Napoca (Kolozsvar), Romania

Received 4 July 1994

Abstract The acid catalyzed decomposition of p-tert-butylcumene hydroperoxide results in acetone and p-tert-butylphenol as the main products. This paper deals with the experimental results obtained on strongly acidic activated cation exchanger resins. ...

Keywords Acidity; Cation exchangers; Organic peroxides decomposition.

...

* Corresponding author.

Figure 3.3: Example of the formatted form of the start of an article that is marked up in SGML.

3.4.5 Author group

Opening tag: <aug>, mandatory.

Closing tag: </aug>, optional.

An author group consists of one or more ‘author blocks’, followed by zero or more affiliation addresses. An ‘author block’ consists of a collaboration or an author, followed by zero or more cross-references (typically to affiliation elements), an optional correspondence address, and zero or more electronic-mail addresses. The element `cor` specifies the correspondence address (see 3.4.5.3). Note that the element `cor` can occur only once within the entire front matter.

An author group must contain at least one collaboration or one author. These elements may be repeated, and the order in which they appear is free. The structures

- `collaboration1 author1,`
- `author1 author2 collaboration1`
- `collaboration1 author1 collaboration2 collaboration3`

are all valid first parts of author groups. The application that processes the SGML document, and produces printed output for instance, needs to take care of punctuation, e.g. ‘and’ and commas, that need to be inserted when presenting the document instance in a particular form.

The list of collaboration(s) and/or author(s) (which contains at least one of these elements) may be followed by one or more affiliations. The relation between an author and an affiliation (‘where the author worked at the time the article was submitted’) can be made explicit by means of the `id` attribute of the affiliation, and a cross-reference with `cross-ref`.

3.4.5.1 Collaboration

Opening tag: <collab>, mandatory.

Closing tag: </collab>, optional.

Contents: text.

A collaboration is a named group or cooperation. As is the case with an author, a collaboration can be explicitly related to an affiliation, by means of the elements organization reference and organization identifier, and also implicitly, by having an affiliation immediately follow the collaboration.

A collaboration consists of an optional `index` element, text, and an optional collaboration affiliation (`caff`).

The `index` element gives the form used for entering in the author index. The textual content of the `collab` element, minus the `index` and `caff` elements, is used for printing.

3.4.5.1.1 Collaboration affiliation

Opening tag: <caff>, mandatory.

Closing tag: </caff>, optional.

Contents: unstructured text (cf. the affiliation element `aff`).

3.4.5.2 Author

Opening tag: <au>, mandatory.

Closing tag: </au>, optional.

An author element consists of a list of degrees (optional), a first name (optional), a surname (mandatory), a suffix (optional), a list of degrees (optional), and a list of rôles (optional). The first name and surname can also appear in reversed order. The suffix element `jr` is intended to mark codes such as Sr, Jr, or the ‘III’ in Henry Ford III. It is not to be used for titles such as Professor, Doctor, Lord, etc. These (academic or nobility) titles should be separated from the author names, and tagged as `degs` elements.

3.4.5.2.1 First name

Opening tag: <fnm>, mandatory.

Closing tag: </fnm>, optional.

Contents: text.

The element `<fnm>` starts with an optional sub-element, `inits`. This specifies the initials as they should be used wherever the first name is abbreviated to initials. If this attribute is missing, the initials are derived from the first name automatically. If the `fnm` element consists of initials only, no `inits` needs to be present. For example: if an author with first name ‘Christian’ would like to see this abbreviated to ‘Chr.’² this would be marked up as follows.

```
<fnm>
  <inits>Chr.</inits>
  Christian
</fnm>
```

3.4.5.2.2 Surname

Opening tag: `<snm>`, mandatory.

Closing tag: `</snm>`, optional.

Contents: text.

The element `<snm>` starts with an optional sub-element, `index`, which specifies the key that should be used in, e.g., sorting an author index. For example, suppose an article has an author with surname Börsig, and this surname needs to be sorted in an author index as Borsig. In that case, one would have to specify the surname as

```
<snm>
  <index>Borsig</index>
  B<a><ac>o<ac>&uml;</a>r<ac>rsig
</snm>
```

Note that this does not affect the *actual* surname printed.

3.4.5.2.3 Suffix

Opening tag: `<jr>`, mandatory.

Closing tag: `</jr>`, optional.

Contents: text (the suffix part of the author’s name).

3.4.5.2.4 Degrees

Opening tag: `<degs>`, mandatory.

Closing tag: `</degs>`, optional.

Contents: text.

This element specifies a sequence of degrees before or after an author’s name. For example

```
<au>
  <fnm>Stig
  <snm>Steen
  <degs>MD, PhD
</au>
```

3.4.5.2.5 Roles

Opening tag: `<roles>`, mandatory.

Closing tag: `</roles>`, optional.

Contents: text.

This element specifies a sequence of rôles or job-titles after an author’s name. For example

```
<au>
  <fnm>Sir Francis
  <snm>Urquhart
  <roles>Past Chair ACGIH
</au>
```

2. The way first names are abbreviated is determined by country and culture.

3.4.5.3 Correspondence address

Opening tag: <cor>, mandatory.
 Closing tag: </cor>, optional.
 Contents: text.

This element specifies the correspondence address for this article, or otherwise identifies the corresponding author. It consists of text and does not contain structural sub-elements. The correspondence address belongs to the collaboration or author that immediately precedes it. Usually there is only one cor element in the entire front-matter.

3.4.5.4 Electronic-mail address

Opening tag: <ead>, mandatory.
 Closing tag: </ead>, optional.
 Contents: text.

This element specifies the electronic-mail address for this article. It consists of text and does not contain structural sub-elements. The electronic-mail address belongs to the immediately preceding collaboration or author.

3.4.5.5 Affiliation

Opening tag: <aff>, mandatory.
 Closing tag: </aff>, optional.

The affiliation element, aff, consists of an optional number, text, an optional city element (cty), a mandatory country element (cny), and text. The order of these components, text, city, country and text, is fixed. Zero or more organization identifiers may occur anywhere in this sequence: inside elements, between elements, but also within text. It has an identifier attribute, id, which can be used for cross-referencing by means of cross-ref.

3.4.5.5.1 Number

Opening tag: <no>, mandatory.
 Closing tag: </no>, optional.
 Contents: text.

All objects that can be the target of a cross-reference (cross-ref) have an optional number element. This is used for capturing the number (and optionally a prefix that indicates the object type) as assigned to the object by the author of the document.

```
<fig id="fig4"><no>Fig. 4</no>...</fig>
<fig id="fig5"><no>Fig. 5a-c</no>...</fig>
<fig id="dia3"><no>Diagram III</no>...</fig>
```

The type text, e.g. “Fig”, need not be tagged separately from the identifier, e.g. “5a-c”. Furthermore, any presentation style should be included in the contents of the no element.

If the no element is allowed in a particular place, but is omitted, some default should be generated. The associated element counter should not be incremented in this case.

If the element is present but empty, no other text should be substituted at that particular position. The associated element counter should not be incremented in this case.

3.4.5.5.2 City

Opening tag: <cty>, mandatory.
 Closing tag: </cty>, mandatory.
 Contents: text.

3.4.5.5.3 Country

Opening tag: <cny>, mandatory.
 Closing tag: </cny>, mandatory.
 Contents: text.

The country element has an optional attribute cny-code, which specifies the country code for that country. This attribute is a two-letter code for the country, as defined in International Standard ISO 3166.

3.4.6 Received date

Opening tag: `<re>`, mandatory.

Closing tag: none.

Contents: text.

The `re` element is an empty element, i.e. an element that has no content and therefore no end-tag. The start tag has three required attributes `day`, `mo` and `yr` of numeric type, which define the components day, month and year of the received date, respectively. The received date should be presented in the language of the main document, i.e. according to the value of the `language` attribute of `art`. For example, in an article written in French `<re day=2 mo=2 yr=1995>` should be presented as, e.g., “Reçu le 2 février 1995”.

3.4.7 Revised date

Opening tag: `<rv>`, mandatory.

Closing tag: none.

Contents: empty. See definition of `<re>` (received date).

3.4.8 Accepted date

Opening tag: `<acc>`, mandatory.

Closing tag: none.

Contents: empty. See definition of `<re>` (received date).

3.4.9 Miscellaneous history information

Opening tag: `<misc>`, mandatory.

Closing tag: `</misc>`, optional.

Contents: text.

This element marks a line (text) in the history that specifies some extra information, for example the communicating editor. Examples: “Communicated by D.D. Holm”, or “Recommended by S.S. Gupta”. Note that the `misc` element itself does not usually generate extra fixed text.

3.4.10 Abstract

Opening tag: `<abs>`, mandatory.

Closing tag: `</abs>`, optional.

An abstract consists of a sequence of one or more paragraphs or sections. The start tag `<abs>` has two optional attributes: `class` and `language`. The `class` attribute specifies the type of abstract, ‘author’s abstract’, ‘editor’s abstract’, ‘INSPEC abstract’ or ‘teaser abstract’ (a condensed or highlight abstract). The `language` attribute specifies the language of the abstract, if different from the main language of the document.

3.4.10.1 Paragraph

Opening tag: `<p>`, mandatory.

Closing tag: `</p>`, optional.

Contents: text.

3.4.11 Keyword group

Opening tag: `<kwdg>`, mandatory.

Closing tag: `</kwdg>`, optional.

A keyword group consists of one or more keywords, i.e. `kwd` elements. The start tag `<kwdg>` has two optional attributes: `class`, which identifies the type of keyword, and `language`, which specifies the language of the keyword group, if different from the main language of the document. The following keyword classes are recognized: `kwd` (uncontrolled keyword, default), `abr` (abbreviations), `jel` (JEL classification codes), `msc` (mathematical subject codes), `pacs` (PACS classification codes), `neurosci` (neuroscience classification codes), `psychinfo` (psychological classification codes), `mat` (materials), `src` (sources), and `idt` (other subject-index terms).

An example:

```

<kwdg class="neurosci">
  <kwd>Cell Biology
    <kwd>Blood brain barrier
  </kwd>
</kwdg>

```

In this example nested keywords are used. The value of the `class` attribute indicates that the first-order keyword should be interpreted as a “Theme” and the second-order one as a “Topic”.

3.4.11.1 Keyword

Opening tag: `<kwd>`, mandatory.

Closing tag: `</kwd>`, mandatory.

Contents: text.

This element contains one keyword, i.e. arbitrary text, with possibly nested (sub-)keywords.

3.4.12 Nomenclature

Opening tag: `<nomenclature>`, mandatory.

Closing tag: `</nomenclature>`, optional.

A `nomenclature` consists of one or more definition lists, i.e. `dl` elements.

3.5 Body

Opening tag: `<body>`, mandatory.

Closing tag: `</body>`, optional.

The article body consists of an optional salutation, followed by a sequence of paragraphs and/or sections in arbitrary order. There must be at least one paragraph or one section, but there may be any number of paragraphs and sections, and in any order. The following structures are all valid body structures:

- *paragraph₁ section₁*
- *section₁ section₂*
- *section₁ paragraph₁ section₂ paragraph₂*

Note that paragraphs are not necessarily parts of sections.

3.5.1 Salutation

Opening tag: `<salutation>`, mandatory.

Closing tag: `</salutation>`, optional.

Contents: text.

The `salutation` element specifies the opening phrase of the article body, such as e.g. “Dear Sir”. This is mostly used in editorial or correspondence items.

3.5.2 Paragraph

See 3.4.10.1.

3.5.3 Section

Opening tag: `<sec>`, mandatory.

Closing tag: `</sec>`, mandatory.

A section consists of an optional number (`no`) and an optional section (`st`) title, followed by an arbitrary sequence of paragraphs and/or sections. A section must contain at least one paragraph or one section, but there may be any number of paragraphs and sections, and in any order. Section can be the target for cross-reference by means of `cross-ref`.

A section may have a section title. If it has one, the title must be the first or second element of the section (depending on whether there is a `no` element). The basic building blocks of sections are paragraphs and sections (which then become subsections). The simplest section consists of one paragraph, optionally preceded by a section title:

```
<sec>
paragraph
</sec>
```

Paragraphs may be repeated, resulting in, for example:

```
<sec>
paragraph-1
paragraph-2
paragraph-3
</sec>
```

The simplest structure of a section containing a subsection is the following:

```
<sec>
  <sec> paragraph-2      : paragraph belongs to subsection
  </sec>
</sec>
```

and so further for deeper levels of embedding:

```
<sec>
  <st> title-1          : section title
  <sec> paragraph-1     : paragraph belongs to subsection
  </sec>
  <sec> paragraph-2     : paragraph belongs to subsection
  </sec>
  <sec> paragraph-3     : paragraph belongs to subsection
    <sec> paragraph-4   : paragraph belongs to subsubsection
    </sec>
  </sec>
</sec>
```

Note that structures such as `<sec></sec>`, `<sec><sec></sec></sec>` etc., are not valid, since the tags `<sec>` and `</sec>` must enclose at least one paragraph or subsection.

No special subsection article elements with explicit mention of nesting depth, e.g. `sec1`, `sec2`, `sec3`, ..., have been defined. This would have been an alternative to embedding sections within sections. Advantages of the option implemented in the current version of the DTD are that editors need not bother about the depth of the section (subsection, subsubsection, subsubsubsection, ...), and that there is no *a priori* limit to the depth of embedding sections. A disadvantage is that the level of embedding of a section cannot be derived from the name of the section element.

3.5.3.1 Section title

Opening tag: `<st>`, mandatory.

Closing tag: `</st>`, optional.

Contents: text.

3.6 Back matter

Opening tag: `<bm>`, mandatory.

Closing tag: `</bm>`, optional.

Back matter consists of six optional parts: acknowledgement, appendix matter, a sequence of bibliographic lists, a sequence of further-reading lists, zero or more glossaries, and zero or more vitae. The order of these elements is fixed.

“Addendum”, “Note added in proof” and “Questions and answers” should – where needed – be treated as sections of the body of the document, or as an appendix.

3.6.1 Acknowledgement

Opening tag: `<ack>`, mandatory.

Closing tag: `</ack>`, optional.

An acknowledgement consists of one or more paragraphs.

3.6.1.1 Paragraph

See 3.4.10.1.

3.6.2 Appendix matter

Opening tag: `<appm>`, optional.

Closing tag: `</appm>`, optional.

The main reason for inserting the element `appendix matter` is to make this DTD compatible with the AAP DTD (see also appendix A). Note that both the start tag and the end tag are optional.

`Appendix matter` consists of one or more appendices.

3.6.2.1 Appendix

Opening tag: `<app>`, mandatory.

Closing tag: `</app>`, optional.

An appendix has the same structure as a section, i.e. it consists of an optional number and an optional section title, followed by an arbitrary sequence of paragraphs and/or sections. There must be at least one paragraph or one section, but there may be any number of paragraphs and sections, and in any order. See 3.5.3 for further explanation. Note that the constituting elements of section and appendix are identical.

`Appendix` can be the target for cross-reference by means of `cross-ref`.

3.6.2.1.1 Section title

See 3.5.3.1.

3.6.2.1.2 Paragraph

See 3.4.10.1.

3.6.2.1.3 Section

See 3.5.3.

3.6.3 Bibliographic list

Opening tag: `<bibl>`, mandatory.

Closing tag: `</bibl>`, optional.

A bibliographic list consists of an optional heading and one or more bibliographic references.

3.6.3.1 Bibliographic reference

Opening tag: `<bib>`, mandatory.

Closing tag: `</bib>`, optional.

A bibliographic reference identifies a document or some other source of information that is referred to (cited) in the text. In the current version of the DTD bibliographic references to journal articles, books, articles in books, proceedings, articles in proceedings, articles in special issues, and preprints are supported; references to other types of publications consist of text.

Syntactically, a bibliographic reference consists of an optional number, and one reference to an article or similar publication, or one reference to another type of publication. It can be the target for cross-reference by means of `cross-ref`. In designing the DTD fragment for references, we assumed that there is an unambiguous relation between citations in the text and bibliographic references in the back matter of the document.

Therefore, the present DTD does not support multiple references under one item in the reference list, i.e. one bibliographic reference is one document. However, it does support the practice that for a certain document multiple publications are identified. Examples of this practice are references 11 and 13 in section 3.6.3.2. To account for this type of reference, we introduced the elements `contribution` and `host`; see sections 3.6.3.1.2 and 3.6.3.1.9.

3.6.3.1.1 Reference to article or similar publication

Opening tag: `<bb>`, mandatory.

Closing tag: `</bb>`, optional.

The element `bb` is reserved for references to textual documents, or, to be more precise: documents that are similar to articles, i.e. the type of document described by the present DTD. Publications such as, e.g., patents and maps are not included in this category.

A bibliographic reference to an article-like publication consists of an optional contribution, and one or more hosts.

3.6.3.1.2 Contribution

Opening tag: `<contribution>`, mandatory.

Closing tag: `</contribution>`, optional.

A contribution is an abstract entity that denotes the independent text or other object (e.g. map, audiotape, television program) and a host the physical entity that ‘contains’ the contribution. Where the contribution is a text, the host may be any such entity as book or issue. We use these terms in a somewhat different sense than ISO 690-2 [9]; the way we use it, the term contribution refers not only to text, as happens in the ISO document, but also to other objects that are referred to in reference lists, and in the present DTD fragment a host may contain, contrary to what ISO suggests, only one contribution.

In our analysis a monograph, or ‘simple’ book, consists of a contribution and a host, where the host contains only one contribution. This contribution could, in principle, be published in other hosts as well: as a chapter in a multiple contributions book, or as an e-publication on the Internet. A contribution contains certain inalienable characteristics: in our proposed model, text-type contributions are defined by their author(s) and title(s). A map-type contribution (which we did not yet consider in depth, but which will probably be added in a future version) could be characterised by cartographer, geographical identification and scale. A host contains bibliographic data of the physical publication, such as an editor, an edition, a title, a publisher and a publication date for books. In the current model, every reference item refers to at most one contribution, with at least one, but possibly more, hosts.

Syntactically, a contribution consists of an optional author group, a title group, and an optional comment.

The title group is either (1) a title optionally followed by a translated title, or (2) a translated title. The title element has a language code. The language of the contribution (or host) is the language of the title. Often, we find references with a made-up title in English, and the comment ‘in Japanese’ or ‘in Chinese’, while the original Japanese or Chinese title is missing. This should be coded by tagging the English title as a translated title, and defining an empty title with a language code denoting the language of the article.

3.6.3.1.3 Authors

Opening tag: `<authors>`, mandatory.

Closing tag: `</authors>`, optional.

An author group in a bibliographic reference consists of one or more blocks. Each block is either a collaboration element `collab`, or one or more author elements `author`, followed by an optional *et al.* indicator.

In case an author group contains both collaborations and authors, these can occur in any desired order. However, there is no mechanism for inserting ‘embedded text’ that indicates the relations between the authors and the collaboration(s), for example certain connective words, commas (or absence thereof), or parentheses. For example, the following

- Abe on behalf of the ZEUS Collaboration, ...
- Abe (ZEUS Collaboration), ...
- Presented by Abe for the ZEUS Collaboration, ...

will either have to be rewritten as

```
<authors>
  <au>
    <snm>Abe
  <collab>ZEUS Collaboration
</authors>
```

or the entire reference of which this is a part must be treated as an unstructured reference (`other-ref`). In the latter case the entire text of the reference can be preserved. It is treated as flat text, in other words without any logical structuring, and is therefore less suitable for linking in an electronic environment.

3.6.3.1.4 Author

Opening tag: <author>, mandatory.

Closing tag: </author>, optional.

An author in a bibliographic reference consists of a surname *snm*, followed by an optional first name *fnm*, and an optional “junior” suffix *jr*.

3.6.3.1.5 Et al

Opening tag: <et-al>, mandatory.

Closing tag: none.

The *et-al* is an empty element. Its presence indicates the omission of other authors or editors, in other words the need for the insertion of the text “*et al.*” in the bibliographic reference.

3.6.3.1.6 Title in bibliographic reference

Opening tag: <title>, mandatory.

Closing tag: </title>, optional.

A title in a bibliographic reference consists of text, optionally followed by a sub-title *sbt*. The title element has an attribute *language* that indicates the language of the title; see page 7.

3.6.3.1.7 Translated title

Opening tag: <translated-title>, mandatory.

Closing tag: </translated-title>, optional.

A translated title in a bibliographic reference consists of text, optionally followed by a sub-title *sbt*. Translators are not yet covered in the present DTD fragment; however, if these are present, they can be captured in the comment element.

3.6.3.1.8 Comment

Opening tag: <comment>, mandatory.

Closing tag: </comment>, optional.

References may contain ‘free text’ everywhere between elements. In the present DTD fragment, comment consists of text and is added as the last element of both contribution and host. The contents of comment will always be presented at the end of respectively contribution information or host information.

3.6.3.1.9 Host

Opening tag: <host>, mandatory.

Closing tag: </host>, optional.

In a bibliographic reference, the host is the physical entity that ‘contains’ the contribution. It consists of exactly one of the elements *issue*, *book*, *edited-book* or *electronic host (e-host)*, optionally followed by *comment*.

3.6.3.1.10 Issue

Opening tag: <issue>, mandatory.

Closing tag: </issue>, optional.

An issue consists of an optional editor group, an optional title group (see section 3.6.3.1.2), an optional conference, a series, zero or more issue numbers, a date, and an optional page range. An issue with a title is considered to be a special issue; see the second example in section 3.6.3.2. Since a special issue may have guest editors, its model contains the element *editors*. Proceedings are either published in a special issue, or an edited-book. Therefore, the model for issue contains optional conference data.

3.6.3.1.11 Conference

Opening tag: <conference>, mandatory.
 Closing tag: </conference>, optional.
 Contents: text (information about conference).

3.6.3.1.12 Editors

Opening tag: <editors>, mandatory.
 Closing tag: </editors>, optional.

An editor group in a bibliographic reference consists of one or more `editor` elements, optionally followed by an *et al.* indicator.

3.6.3.1.13 editor

Opening tag: <editor>, mandatory.
 Closing tag: </editor>, optional.

An editor in a bibliographic reference consists of a surname `snm`, followed by an optional first name `fnm`, and an optional “junior” suffix `jr`.

3.6.3.1.14 Series

Opening tag: <series>, mandatory.
 Closing tag: </series>, optional.

Issues have mandatory series information, `series`, containing a title group (title and optional translated title, or just translated title) and an optional volume number (or range of volume numbers). Books and edited books have optional series information, `book series`, that adds editors to the series information.

3.6.3.1.15 Volume number

Opening tag: <volume-nr>, mandatory.
 Closing tag: </volume-nr>, optional.
 Contents: text (volume number or range of volume numbers).

3.6.3.1.16 Issue number

Opening tag: <issue-nr>, mandatory.
 Closing tag: </issue-nr>, optional.
 Contents: text (issue number or range of issue numbers).

3.6.3.1.17 Date

Opening tag: <date>, mandatory.
 Closing tag: </date>, optional.
 Contents: text.

It seems logical to assign a date to the element `contribution`, denoting its ‘inception’. Inception dates are, however, not used. The inception date is identical to the publication date of the ‘first’ host.

3.6.3.1.18 Pages

Opening tag: <pages>, mandatory.
 Closing tag: </pages>, optional.

The page range element `pages` consists of a first page, optionally followed by a last page.

3.6.3.1.19 *First page*

Opening tag: <first-page>, mandatory.
Closing tag: </first-page>, optional.
Contents: text.

3.6.3.1.20 *Last page*

Opening tag: <last-page>, mandatory.
Closing tag: </last-page>, optional.
Contents: text.

3.6.3.1.21 *Book*

Opening tag: <book>, mandatory.
Closing tag: </book>, optional.

A book in a bibliographic reference consists of an optional title group (see above), an optional edition, an optional book series, one or more dates, and an optional publisher.

3.6.3.1.22 *Edition*

Opening tag: <edition>, mandatory.
Closing tag: </edition>, optional.
Contents: text.

3.6.3.1.23 *Publisher*

Opening tag: <publisher>, mandatory.
Closing tag: </publisher>, optional.

A publisher consists of a name, optionally followed by a location.

3.6.3.1.24 *Publisher name*

Opening tag: <name>, mandatory.
Closing tag: </name>, optional.
Contents: text (publisher name).

3.6.3.1.25 *Publisher location*

Opening tag: <location>, mandatory.
Closing tag: </location>, optional.
Contents: text (publisher location).

3.6.3.1.26 *Edited book*

Opening tag: <edited-book>, mandatory.
Closing tag: </edited-book>, optional.

An edited book consists of an optional editor group (see above), an optional title group (see above), an optional conference, an optional edition, an optional book series, one or more dates, and an optional publisher. Proceedings are either published in a special issue, or an edited-book. Therefore, the model for edited-book contains optional conference data.

3.6.3.1.27 *Book series*

Opening tag: <book-series>, mandatory.
Closing tag: </book-series>, optional.

A book series consists of an optional editor group and a series.

3.6.3.1.28 *Electronic host*

Opening tag: <e-host>, mandatory.

Closing tag: </e-host>, optional.

Contents: text and one optional sub-element.

This element is used for tagging independent electronic hosts for bibliographic references. A possible application of this element is shown in example 13 in section 3.6.3.2.

The e-host element consists of an optional inter-document reference and an optional date element. The date element is mandatory with all other hosts, but in electronic hosts it is often lacking; this made it necessary to add it as an optional constituent.

In future, a reference type e-publication will probably be added, at the same level as patents and maps, to account for more complex references to electronic publications. Presumably, the element e-host will be part of the definition of the future e-publication.

3.6.3.1.29 *Other reference*

Opening tag: <other-ref>, mandatory.

Closing tag: </other-ref>, optional.

Contents: text.

This element is used for references to publications that are not similar to articles, so for example patents and maps. It contains no sub-elements.

3.6.3.2 *Examples of bibliographic references*

This section contains thirteen examples of references tagged according to the present DTD fragment for bibliographic references. Indentation, line breaks and spacing are used in these examples for clarity only: in actual documents these will be absent.

1. Journal article, 2 authors et al., paginated by issue.

[1] Paivio, A. & Becker, L.J. *et al.* (1975) Comparisons through the mind's eye. *Cognition*, 37 (2), 635–647.

```
<bib id="ref1">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Paivio
          <fnm>A.
        <author>
          <snm>Becker
          <fnm>L.J.
        <et-al>
      <title>Comparisons through the mind's eye
    <host>
      <issue>
        <series>
          <title>Cognition
          <volume-nr>37
        <issue-nr>2
        <date>1975
        <pages>
          <first-page>635
          <last-page>647
```

2. Entire issue of journal. Because the issue has a title, it is presented as a special issue.

[2] Glaser, R. & Bond, L. (Eds.) (1981) Testing: concepts and research [Special issue]. *American Psychologist*, 36 (10)

```
<bib id="ref2">
  <bb>
    <host>
```

```

<issue>
  <editors>
    <editor>
      <snm>Glaser
      <fnm>R.
    <editor>
      <snm>Bond
      <fnm>L.
  <title>Testing: concepts and research
  <series>
    <title>American Psychologist
    <volume-nr>36
  <issue-nr>10
  <date>1981

```

3. Journal supplement, only first page given.

[3] Koczkas, S., Holmberg, G. & Wedin, L. (1981) A pilot study of the effect of ... Acta Psychiatrica Scandinavica, 63 (Suppl. 290), 328

```

<bib id="ref3">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Koczkas
          <fnm>S.
        <author>
          <snm>Holmberg
          <fnm>G.
        <author>
          <snm>Wedin
          <fnm>L.
      <title>A pilot study of the effect of ...
    <host>
      <issue>
        <series>
          <title>Acta Psychiatrica Scandinavica
          <volume-nr>63
          <issue-nr>Suppl. 290
          <date>1981
        <pages>
          <first-page>328

```

4. Non-English journal article, title translated into English.

[4] Assink, E.M.H. & Verloop, N. (1977) Het aanleren van deel-geheel relaties [Teaching part-whole relations]. Pedagogische Studien, 54, 130–142

```

<bib id="ref4">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Assink
          <fnm>E.M.H.
        <author>
          <snm>Verloop
          <fnm>N.
      <title language="NL">Het aanleren van deel-geheel relaties
      <translated-title>Teaching part-whole relations
    <host>
      <issue>
        <series>
          <title>Pedagogische Studien
          <volume-nr>54

```

```

<date>1977
<pages>
  <first-page>130
  <last-page>142

```

5. Book, third edition.

[5] Strunk, W., Jr. & White, E.B. (1979) *The elements of style* (3rd Ed.). New York: MacMillan

```

<bib id="ref5">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Strunk
          <fnm>W.
          <jr>Jr.
        <author>
          <snm>White
          <fnm>E.B.
      <title>The elements of style
    <host>
      <book>
        <edition>3rd Ed.
        <date>1979
        <publisher>
          <name>MacMillan
          <location>New York

```

6. Edited book.

[6] Letheridge, S. & Cannon, C.R. (Eds.) (1980) *Bilingual education: Teaching English as a second language*. New York: Praeger

```

<bib id="ref6">
  <bb>
    <host>
      <edited-book>
        <editors>
          <editor>
            <snm>Letheridge
            <fnm>S.
          <editor>
            <snm>Cannon
            <fnm>C.R.
        <title>Bilingual education: Teaching English as a second language
        <date>1980
        <publisher>
          <name>Praeger
          <location>New York

```

7. Book without authors and editors.

[7] *College bound seniors* (1979) Princeton, NJ: College Board Publications

```

<bib id="ref7">
  <bb>
    <host>
      <book>
        <title>College bound seniors
        <date>1979
        <publisher>
          <name>College Board Publications
          <location>Princeton, NJ

```

8. Several volumes in a multi-volume edited work, publication over more than one year.

[8] Wilson, J.G. & Fraser, F.C. (Eds.) (1977–1978) *Handbook of teratology* (Vols. 1–4). New York: Plenum Press

```

<bib id="ref8">
  <bb>
    <host>
      <edited-book>
        <book-series>
          <editors>
            <editor>
              <snm>Wilson
              <fnm>J.G.
            <editor>
              <snm>Fraser
              <fnm>F.C.
          <series>
            <title>Handbook of teratology
            <volume-nr>Vols. 1&ndash;4
          <date>1977
          <date>1978
          <publisher>
            <name>Plenum Press
            <location>New York

```

9. English translation of a book.³

[9] Luria, A.R. (1969) The mind of a mnemonist (L. Solotarof, Trans.) New York: Avon books (Original work published 1965)

```

<bib id="ref9">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Luria
          <fnm>A.R.
        <title>The mind of a mnemonist
        <comment>(L. Solotarof, Trans.)</comment>
      <host>
        <book>
          <date>1969
          <publisher>
            <name>Avon books
            <location>New York
          <comment>(Original work published 1965)</comment>

```

10. Article or chapter in edited book.

[10] Gurman, A.S. & Kniskern, D.P. (1981) Family therapy outcome research: knowns and unknowns. In: A.S. Gurman & D.P. Kniskern (Eds.) Handbook of family therapy (pp. 742–775) New York: Brunner/Mazel

```

<bib id="ref10">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Gurman
          <fnm>A.S.
        <author>
          <snm>Kniskern
          <fnm>D.P.
        <title>Family therapy outcome research: knowns and unknowns
      <host>
        <edited-book>
          <editors>
            <editor>
              <snm>Gurman

```

3. There is no separate element for translator yet.

```

    <fnm>A.S.
  <editor>
    <snm>Kniskern
    <fnm>D.P.
  <title>Handbook of family therapy
  <date>1981
  <pages>
    <first-page>742
    <last-page>775
  <publisher>
    <name>Brunner/Mazel
    <location>New York

```

11. Article in edited book, reprinted from another source.

[11] Sluzki, C.E. & Beavin, J. (1977) Symmetry and complementarity. In: P. Watzlawick & J.H. Weakland (Eds.) The interactional view (pp. 71–87) New York: Norton. Reprint from: Acta Psiquiatrica y Psicologica de America Latina, 1965, 11, 321–330

```

<bib id="ref11">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Sluzki
          <fnm>C.E.
        <author>
          <snm>Beavin
          <fnm>J.
      <title>Symmetry and complementarity
    <host>
      <edited-book>
        <editors>
          <editor>
            <snm>Watzlawick
            <fnm>P.
          <editor>
            <snm>Weakland
            <fnm>J.H.
        <title>The interactional view
        <date>1977
        <pages>
          <first-page>71
          <last-page>87
        <publisher>
          <name>Norton
          <location>New York
        <comment>Reprint from:</comment>
      <host>
        <issue>
          <series>
            <title>Acta Psiquiatrica y Psicologica de America Latina
            <volume-nr>11
          <date>1965
          <pages>
            <first-page>321
            <last-page>330

```

12. Proceedings published as a book.

[12] Chaddock, T.E. (1974) Gastric emptying of a nutritionally balanced liquid diet. In: E.E. Daniel (Ed.) Proceedings of the Fourth International Symposium on Gastrointestinal Motility (pp. 83–92). Vancouver, British Columbia, Canada: Mitchell Press

```

<bib id="ref12">
  <bb>

```

```

<contribution>
  <authors>
    <author>
      <snm>Chaddock
      <fnm>T.E.
    <title>Gastric emptying of a nutritionally balanced liquid diet
  </host>
  <edited-book>
    <editors>
      <editor>
        <snm>Daniel
        <fnm>E.E.
      <title>Proceedings of the Fourth International Symposium
        on Gastrointestinal Motility
      <date>1974
    <pages>
      <first-page>83
      <last-page>92
    <publisher>
      <name>Mitchell Press
      <location>Vancouver, British Columbia, Canada

```

13. Preprint.

[13] Yu, F. & Wu, X.-S. (1992) Phys. Rev. Lett., 68, 2996 (hep-th/9112009)

```

<bib id="ref13">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Yu
          <fnm>F.
        <author>
          <snm>Wu
          <fnm>X.-S.
      </host>
      <issue>
        <series>
          <title>Phys. Rev. Lett.
          <volume-nr>68
          <date>1992
        <pages>
          <first-page>2996
      </host>
      <e-host><inter-ref object-type="preprint">hep-th/9112009</e-host>

```

14. Article in proceedings, containing several references to external electronic objects.

[14] F. Dougliis (homepage at <http://www.research.att.com/orgs/ssr/people/dougliis>) and Th. Ball (homepage at <http://www.research.att.com/orgs/ssr/people/tball>), Tracking and viewing changes on the web, (<http://www.research.att.com/orgs/ssr/people/dougliis/papers/aide.ps.gz>). In: Proc. 1996 USENIX Technical Conference, (<http://usenix.org/sd96.html>), January 1996.⁴

```

<bib id="ref14">
  <bb>
    <contribution>
      <authors>
        <author>
          <snm>Dougliis
          <inter-ref locator="http://www.research.att.com/orgs/ssr/people/dougliis"
            locator-type="http"
            object-type="homepage">

```

4. This is a real-life example, found as reference [9] on page 1344 of the Proceedings of the Fifth International WWW Conference, published by Elsevier Science.

```

    </inter-ref>
    <fnm>F.
  <author>
    <snm>Ball
    <inter-ref locator="http://www.research.att.com/orgs/ssr/people/tball"
      locator-type="http"
      object-type="homepage">
    </inter-ref>
    <fnm>Th.
  <title>
    <inter-ref locator="http://www.research.att.com/orgs/ssr/people/douglis/
      papers/aide.ps.gz"
      locator-type="http"> Tracking and viewing changes on the web
    </inter-ref>
  <host>
  <edited-book>
    <title>
      <inter-ref locator="http://usenix.org/sd96.html"
        locator-type="http"
        Proc. 1996 USENIX Technical Conference
      </inter-ref>
    <date>January 1996

```

3.6.4 Further reading

Opening tag: `<further-reading>`, mandatory.

Closing tag: `</further-reading>`, optional.

A further-reading list has the same structure as a list of bibliographic references; see section 3.6.3. However, entries in a further-reading list can never be cross-referenced from the text (cited).

3.6.5 Glossary

Opening tag: `<glossary>`, mandatory.

Closing tag: `</glossary>`, optional.

A glossary consists of an optional title, followed by one or more glossary entries.

3.6.5.1 Glossary entry

Opening tag: `<glossary-entry>`, mandatory.

Closing tag: `</glossary-entry>`, optional.

A glossary entry consists of a heading, followed by zero or more glossary definitions, zero or more cross-references, and zero or more sub-entries.

3.6.5.1.1 Glossary heading

Opening tag: `<glossary-heading>`, mandatory.

Closing tag: `</glossary-heading>`, optional.

A glossary heading consists of text, optionally followed by a sequence of sub-headings.

3.6.5.1.2 Glossary definition

Opening tag: `<glossary-def>`, mandatory.

Closing tag: `</glossary-def>`, optional.

A glossary definition consists of text.

See chapter 5 for more information.

3.6.6 Biographic information

Opening tag: <vt>, mandatory.

Closing tag: </vt>, optional.

The element vt can occur zero or more times. Each occurrence of the element vt contains the biographic information of *one* of the authors of the document, and consists of one or more paragraphs. A picture of the author, if present, should be included in a separate entity (artwork file), which is then specified with the picture attribute of <vt>. For referencing purposes this element also has an id attribute, which relates a vt element to an author.

3.6.6.1 Paragraph

See 3.4.10.1.

Chapter 4

Index structure

In this chapter we will describe the main structure of the document type definition for subject indexes.

4.1 Indexes as separate documents

The main reason for developing a separate DTD for indexes is that the content of indexes depends on the specific data set for which they were created, and on their purpose (or the purpose that their creator has in mind). They are the product of intellectual effort, and should be treated as independent documents or document fragments, pertaining to the specific data set that they were created for.

An indexer working on a specific article in a data set has to decide under which headings and subheadings in the index to locate the article. The selection of headings and sub-headings depends not only on the contents of the article itself, but also on the contents of the other articles in the same set. Also, deciding where to use see and see-also references, and how to order index entries, depends on the complete index, and therefore on the complete set of articles. This might seem natural, and not worth so much emphasis. However, it has a somewhat unwelcome implication, namely that the reuse of indexes for other data sets (a sub-set of the original set, the union of two sets, etcetera) than those that they were created for cannot be done straightforwardly without loss of quality.

Suppose we have data-sets D1 and D2 with corresponding indexes I1 and I2, and further suppose that we want to create an index I3 over the union of D1 and D2, which we call data-set D3. If we merge I1 and I2 to produce I3 we cannot guarantee that I3 covers D3 as well as I1 and I2 cover D1 and D2 respectively. It might be necessary to re-order, rename or add entries, in order to account for dependencies between articles in D1 with articles in D2.

A concrete, though fictitious, example is the following. Imagine a special issue in an geographic journal entirely devoted to Scotland. Then, 'Scotland' is not a useful index entry in the index to this issue. Now, we include articles from this special issue in an archival product, consisting of the last five volumes of the journal. Then, 'Scotland' in the index to the archival product provides effective access to the articles that were previously published in the special issue.

Production of indexes (probably the same goes for glossaries, but evidence is still lacking) is also in line with the idea that they are created for a specific data-set: often just before completion of a volume or set of volumes the index is made for all the articles in the volume(s). The idea that indexes depend on the data-set, in combination with the fact that they are often created some time after publication of the source articles has led us to believe that it is not useful to develop a model in which appropriate index entries are stored separately with individual articles and combined to produce an index when desired (e.g. for a master or cumulative index). We decided it would be equally useful and more practical to develop models in which indexes are represented in their entirety as separate documents or document fragments.

A consequence of the limitations for reuse and the assignment of index entries to an article sometime after publication is, that these indexes may not be a continuous and consistent disclosure system. An index system may be a very effective disclosure tool for a particular data-set, but it may be insufficient for timely and uniform access to large collections and streams of articles.

4.2 The model

The starting points for the development of the DTD for indexes were the following.

- The DTD should offer a storage model for indexes as separate documents or document fragments.

- The structure defined by the DTD should be closely related to the structure created by the indexer.
- The structure should allow for linking between index entries within the index: see and see-also references.
- The structure should allow for linking between indexes on the one hand and source documents on the other hand. We assume that entries in an index refer back to source documents.
- The relation between the index and a source document is captured in a document identifier.
- The structure should allow for presentation on paper and in an electronic environment.
- At present indexes are always treated as separate documents. Therefore the present release does not contain a model for indexes that are embedded in articles.
- Indexes that cover a set of source documents are often created after the SGML coding of the documents they pertain to is finalized. The indexer may use printed versions of the documents to base his index on. This is accounted for in the models below, by the attributes for volume, issue number and first page in the definition of the `locr` element.
- Index entries will be manually put in alphabetical order by their creator, the reason being that good sorting is dependent on the dataset, which poses problems to automatic sorting.
- Indexes can refer to documents as a whole, but also to parts (e.g. paragraphs, sections, pages) of documents. Evidently, for indexes as part of the back matter it only makes sense to refer to the specific locations of the terms in the document (just as back-of-the-book indexes refer to specific pages). Since we foresee that in future indexes might be created that refer to specific parts of documents, we added the possibility to refer to specific locations within the document.
- The index DTD is storage DTD. Tools have to be developed to support production of the documents.
- For naming the elements, we follow NISO Z39.4-19X as much as possible.

4.3 Index

Opening tag: `<index>`, mandatory.

Closing tag: `</index>`, mandatory.

The `index` element consist of an optional title, an optional list of sources, an optional indexer, an optional list of abbreviations, and one or more index entries.

It has three attributes. The attribute `version` denotes the version of the DTD that has to be used with the article in question, between quotes. The `pii` attribute is a free-text attribute (CDATA), and contains the PII. The last attribute, `language`, specifies the main language of the document, by means of a two-letter language code taken from International Standard ISO 639:1988; the recognized codes are `en` (English, default), `fr` (French), `de` (German), `es` (Spanish), `pt` (Portuguese) and `ru` (Russian).

4.3.1 Title

Opening tag: `<title>`, mandatory.

Closing tag: `</title>`, optional.

The `title` element consist of unstructured text.

4.3.2 Sources

Opening tag: `<sources>`, mandatory.

Closing tag: `</sources>`, optional.

The `sources` element consists of unstructured text. It describes the sources the index refers to.

4.3.3 Indexer

Opening tag: `<indexer>`, mandatory.

Closing tag: `</indexer>`, optional.

The `indexer` element consist of unstructured text. It is the name of the indexer, optionally surrounded by text such as e.g. "Compiled by".

4.3.4 Abbreviations

Opening tag: <abbreviations>, mandatory.

Closing tag: </abbreviations>, optional.

The `abbreviations` element consist of unstructured text. It lists the abbreviations used in the index.

4.3.5 Index entry

Opening tag: <index-entry>, mandatory.

Closing tag: </index-entry>, mandatory.

The `index-entry` element consist of an index heading, zero or more location references, zero or more cross-references, and zero or more nested index entries (sub-entries). Each index entry has an `id` attribute, for purposes of cross-referencing.

4.3.5.1 Index heading

Opening tag: <index-heading>, mandatory.

Closing tag: </index-heading>, mandatory.

The `index-heading` element consist of unstructured text, followed by zero or more nested headings (sub-headings).

4.3.5.2 Location reference

Opening tag: <locr>, mandatory.

Closing tag: </locr>, mandatory.

The `locr` element consist of an optional inter-document reference, an optional intra-document reference, an optional volume number, an optional issue number, an optional pages specification, and optional comment. These elements are as described in chapter 3.

4.4 Example

An example of an index marked up according to the Elsevier Science index DTD is given below (in this example indentation, line breaks and spacing are used in these examples for clarity only – in actual documents these will be absent).

```
<!doctype index public "-//ES/DTD index DTD version 1.0.0//EN"
[
<!entity some-pii system "s123" ndata text>
]>

<index version="1.0.0" pii="some-pii" language="EN">
  <index-entry id=ind1>
    <index-heading>DTD</index-heading>
    <cross-ref refid=ind2></cross-ref>
  </index-entry>

  <index-entry id=ind2>
    <index-heading>SGML
      <index-heading>Standard Generalized Markup Language</index-heading>
    </index-heading>
    <locr><intra-ref locator="some-pii"></intra-ref></locr>
    <cross-ref refid=ind1></cross-ref>

  <index-entry>
```

```
<index-heading>tag</index-heading>
<locr><intra-ref refid="sec3" locator="some-pii"></intra-ref></locr>
</index-entry>

<index-entry>
  <index-heading>attribute</index-heading>
  <locr><volume-nr>111<issue-nr>4<pages><first-page>16</locr>
</index-entry>
</index-entry>
</index>
```

Chapter 5

Glossary

In this chapter we will describe the main structure of the document type definition for glossaries.

5.1 Glossaries as separate documents

Much of the reasoning in the previous chapter, about subject indexes, applies to glossaries as well. A structure for glossaries that is entirely presentation-oriented is clearly insufficient. Such an approach would make them (almost) useless as disclosure tool, because the link between glossaries on the one hand and their source documents on the other would get lost. We can imagine that for instance in an electronic journal environment, glossaries, which are often very informative, are a productive disclosure mechanism to a reader. Also, the ability for a reader to jump from an unknown term to the appropriate definition in a glossary seems to be a valuable function.

5.1.1 The model

The starting points for the development of the DTD for glossaries were the following.

- The DTD should offer a storage model for glossaries as separate documents or document fragments.
- The structure defined by the DTD should be closely related to the structure created by the compiler of the glossary.
- The structure should allow for linking between glossary entries within the glossary: see and see-also references.
- The structure should allow for linking between glossaries on the one hand and source documents on the other hand. We assume that terms in source documents ‘refer forward’ to glossaries.
- Where the glossary is a separate document, the relation between the glossary and the source documents is captured in a document identifier.
- The structure should allow for presentation on paper and in an electronic environment. Glossaries can be part of the back matter of a document, or they can be separate documents. We developed models for both cases.
- Separate glossaries that cover a set of source documents are often created after the SGML coding of the documents they pertain to is finalized. The indexer may use printed versions of the documents to base his glossary on. This is accounted for in the models below, by the attributes for volume, issue number and first page in the definition of the `locr` element. However, this could pose problems with ‘forward-linking’ from source document(s) to the glossary.
- Glossary entries will be manually put in alphabetical order by their creator, the reason being that good sorting is dependent on the dataset, which poses problems to automatic sorting.
- The glossary index DTD is a storage DTD. Tools have to be developed to support production of the documents.
- For naming the elements we follow NISO Z39.4-119X as much as possible.
- Although the structure of glossaries and indexes appears to be very similar – a glossary can be seen as an index with definitions, or an index as a glossary with locators – merging them to one structure did not seem to be a productive idea. The motivation behind this is:
 - we do not know of any glossary with locators, and
 - we do not know of any index with definitions.

5.2 Glossary

Opening tag: <glossary>, mandatory.

Closing tag: </glossary>, optional.

The `glossary` element consist of an optional section title, and one or more glossary entries.

It has three attributes. The attribute `version` denotes the version of the DTD that has to be used with the article in question, between quotes. The `docid` attribute is a free-text attribute (CDATA), and contains some document identifier.

The last attribute, `language`, specifies the main language of the document, by means of a two-letter language code taken from International Standard ISO 639:1988; the recognized codes are `en` (English, default), `fr` (French), `de` (German), `es` (Spanish), `pt` (Portuguese) and `ru` (Russian).

5.2.1 Section title

Opening tag: <st>, mandatory.

Closing tag: </st>, optional.

The `st` element consist of unstructured text.

5.2.2 Glossary entry

Opening tag: <glossary-entry>, mandatory.

Closing tag: </glossary-entry>, optional.

The `glossary-entry` element consist of a glossary heading, zero or more glossary definitions, zero or more cross-references (see chapter 3), and zero or more nested glossary entries (sub-entries). Each glossary entry has an `id` attribute, for purposes of cross-referencing.

5.2.2.1 Glossary heading

Opening tag: <glossary-heading>, mandatory.

Closing tag: </glossary-heading>, optional.

The `glossary-heading` element consist of unstructured text, followed by zero or more nested glossary headings (sub-headings).

5.2.2.2 Glossary definition

Opening tag: <glossary-definition>, mandatory.

Closing tag: </glossary-definition>, optional.

The `glossary-definition` element consist of unstructured text.

5.3 Example

An example of a glossary marked up according to the Elsevier Science glossary DTD is given below (in this example indentation, line breaks and spacing are used in these examples for clarity only – in actual documents these will be absent).

```
<!doctype glossary public "-//ES/DTD glossary DTD version 1.0.0//EN" []>
<glossary version="1.0.0" docid="some-id" language="EN">
  <glossary-entry id=glo1>
    <glossary-heading>DTD</glossary-heading>
    <cross-ref refid=glo2></cross-ref>
```

```
</glossary-entry>

<glossary-entry id=glo2>
  <glossary-heading>SGML</glossary-heading>
  <glossary-def>yyyyyyy Goldfarb yyyyyyyy</glossary-def>
  <cross-ref refid=glo3></cross-ref>
</glossary-entry>

<glossary-entry id=glo3>
  <glossary-heading>Pandora</glossary-heading>
  <glossary-def>zzzz <cross-ref refid=glo2></cross-ref> zzzz</glossary-def>
</glossary-entry>
</glossary>
```

Chapter 6

Text structure

As stated previously, SGML defines the structure of a document, not its presentation on any medium whatsoever. The presentation used in a printed journal, for example, is defined in the typesetting instructions for that particular journal. Defining the text “structure” is not related to its appearance therefore, except where its format must remain fixed, irrespective of the output medium, as is often the case with e.g. mathematical formulas. Another example: a phrase or word may need to be in italic and this needs to be identified.

Individual characters, such as greek characters, will also be defined by means of a code, e.g. `α`, an *entity reference* in SGML terms. These entity references are based on the ISO public entity sets; a complete list can be found in appendix H.

An article (or index, or glossary) as a whole, as defined in the previous chapters, has a coarse-grained structure. The running text, for example of paragraphs, also has a, more fine-grained, structure. This structure consists of elements that are also defined in the DTD. These elements are:

- footnote
- anchor
- quotation
- enunciation
- cross-reference
- link
- intra-document reference
- inter-document reference
- list
- definition list
- table
- in-line figure, floating figure, scheme and plate
- text-box
- unprinted item
- inline and displayed formula
- bibliographic reference
- elements for built-up text, including font changes
- plain text (parsed character data: #PCDATA)

In this chapter these elements will be described.

6.1 Footnote

Opening tag: `<fn>`, mandatory.

Closing tag: `</fn>`, mandatory.

A footnote is a note that documents the text, and corresponds to a reference, e.g. a number, in the text. Footnotes consist of an optional number, and one or more paragraphs. Footnotes are printed at the foot of the page. A footnote can be the target for cross-reference by means of `cross-ref`. The contents of the element are put into a ‘floating element’, which is put on the current page when possible, and otherwise on the next page. The tag `<fn>` does not generate a reference in the text. This must be generated with the tag `<cross-ref>` at the place(s) in the text where a footnote reference needs to appear. The `id` attribute is required for this element. See the relevant typesetting instructions for the journal concerned for details about the presentation of this element.

6.2 Anchor

Opening tag: `<anchor>`, mandatory.

Closing tag: `</anchor>`, mandatory.

An anchor is a piece of text than can be the target of e.g. a cross-reference. The `id` attribute is required for this element.

6.3 Displayed quotation

Opening tag: `<qd>`, mandatory.

Closing tag: `</qd>`, mandatory.

A quotation is an exact reproduction or paraphrase of a part of a document. A block or displayed quotation is a quotation that is set off from the rest of the text, without quotation markers, and usually in a different font (size) or indented or both. A displayed quotation consists of one or more paragraphs. See the relevant typesetting instructions for the journal concerned for details about the presentation of this element.

6.4 Enunciations

Opening tag: `<enun>`, mandatory.

Closing tag: `</enun>`, mandatory.

Enunciations are the catch-all phrase we have given to a special category of structuring elements that occurs quite often in, for instance, mathematical papers. Examples of such elements are “Theorem”, “Proof” and “Definition”. Syntactically, an enunciation consists of an optional `no` element, an optional title (`st`), and one or more paragraphs. The `enun` element has an optional `id` attribute that is used for cross-referencing.

For example,

Theorem 1 (Main theorem) The dynamic programming ...

would be marked up as

```
<enun id="enun1"><no>Theorem 1<st>Main theorem
<p>The dynamic programming ...
```

Since it is impossible to define a fixed list of theorem types, e.g. “Theorem”, “Proof”, “Definition” etcetera, the type must be given explicitly in the `no` element.

6.5 Cross-reference

Opening tag: `<cross-ref>`, mandatory.

Closing tag: `</cross-ref>`, mandatory.

Contents: text.

A cross-reference is a reference to an element in the same document instance. For presentation purposes the contents of the element can be used. The (mandatory) `id` attribute specifies a list of one or more identifiers. Each identifier corresponds to an object in the document instance.

This element is used instead of `figr`, `tblr` etcetera of the previous release. The most prominent change is that the fixed text that was previously generated, e.g. “Fig.”, is now *included* in the SGML document, *within* the `cross-ref` element, and is not implied by a style-sheet. This implies that the presentation of the cross-reference is more or less *fixed*: it can only be manipulated as a whole, or by the use of search-and-replace patterns.

A second change is that the `cross-ref` element allows one-to-many mappings, i.e. from a single `cross-ref` element to two or more objects.¹

Some elementary examples:

1. This use of `cross-ref`, with a list of 2 or more identifiers is theoretically allowed, but this possibility should be used as little as possible. Presentation of cross-references that do not point to a single document can be quite cumbersome, especially in electronic media.

See Table 4 for ...
 See Figs. 4 and 5 for ...
 See Plate IV for ...
 See [1,5] for ...
 Smith et al. (1996) showed ...
 In (Smith et al., 1996, Lemma 5) it ...
 According to Theorem A.5 we ...
 Defluorinations of **197** were ...

See `<cross-ref refid="tbl4">Table 4</cross-ref>` for ...
 See `<cross-ref refid="fig4 fig5">Figs. 4 and 5</cross-ref>` for ...
 See `<cross-ref refid="pla4">Plate IV</cross-ref>` for ...
 See `<cross-ref refid="bib1 bib5">[1,5]</cross-ref>` for ...
`<cross-ref refid="bib24">Smith et al. (1996)</cross-ref>` showed ...
 According to `<cross-ref refid="thea5">Theorem A.5</cross-ref>` we ...
 Defluorinations of `<cross-ref refid="fx26">197</cross-ref>` were ...

Some examples of “merged references”:

In Tables 2, 4–6 and 13 it ...
 (Jansen, 1908a, b; Smith, 1987, 1988; Jones, 1990)

In `<cross-ref refid="tbl2 tbl4 tbl5 tbl6 tbl13">Tables 2, 4-6 and 13</cross-ref>` it ...
`<cross-ref refid="bib21 bib22 bib91 bib93 bib28">(Jansen, 1908a, b; Smith, 1987, 1988; Jones, 1990)</cross-ref>` ...

6.6 Link

Opening tag: `<link>`, mandatory.

Closing tag: none.

Contents: empty element.

A `link` element specifies that a local external entity, i.e. an entity that is under control of the publisher, should be “inserted” at this point in the document. An example is an external file with a piece of artwork.

The `link` is an element that is declared empty, i.e. it has only a start tag `<link>` and no end tag. It has one attribute element, `file`, which is a reference to an external entity that is under control of the publisher. This entity contains the actual table or figure, for example, in some appropriate format.

6.7 Intra-document reference

Opening tag: `<intra-ref>`, mandatory.

Closing tag: `</intra-ref>`, mandatory.

The `intra-ref` element is an intra-document reference, in other words a reference to an external entity that is under control of the publisher. The `intra-ref` element has three attributes: `refid`, `locator`, and `object-type`.

The `locator` attribute specifies the target document, i.e. an external entity.

The `object-type` attribute specifies the type of target document; this can have the values `preprint`, `embase` or `geobase`.

The `refid` attribute specifies the identifier of an object within the document.

6.8 Inter-document reference

Opening tag: `<inter-ref>`, mandatory.

Closing tag: `</inter-ref>`, mandatory.

The `inter-ref` element is an inter-document reference, in other words a reference to an external entity that is not under control of the publisher. The `inter-ref` element has four attributes: `refid`, `locator`, `locator-type` and `object-type`.

The `locator` attribute specifies the target document, i.e. an external entity. It can be, for example, a URL, a URN, or a preprint number.

The `locator-type` attribute specifies the type of locator used; this can have the values `url`, `urn`, `xxx-archive` or `cern`.

The `object-type` attribute specifies the type of target document referred to; this can have the values `preprint`, `embase` or `geobase`.

The `refid` attribute specifies the identifier of an object within the document.

A simple example is given below.

```
<p>A demo of the tour structure mechanism is available on the
<inter-ref locator="http://www4.informatik.uni-erlangen.de/Perplex/"
locator-type="http" object-type="homepage">Perplex homepage</inter-ref>...</p>
```

In presentation one can decide to print the value of the `locator` attribute, or to suppress it. For example, on conversion to HTML, the attribute would not be displayed, but would be used as the `href` attribute of the (HTML) `<a>` tag.

A more elaborate example, showing the use of `inter-ref` in bibliographic references, is given in section 3.6.3.2. Since the `inter-ref` cannot span multiple structural elements, it is impossible in this example to let `inter-ref` span complete `author` elements. In presentation one could therefore decide to assign a special interpretation to empty `inter-ref` elements that occur in `author` elements, e.g. use the entire `author` element as the begin point of a hypertext link.

6.9 List

Opening tag: `<l>`, mandatory.

Closing tag: `</l>`, mandatory.

A list consists of an optional number (`no`), an optional heading (`st`), and one or more list items. The start tag `<l>` has one required attribute, `type`, that specifies the type of the list: `ord` for ordered (numbered), `unord` for unordered (un-numbered, bulleted) or `tab` for no item label, but only indentation (tabbing). An example is given below:

```
<l type="unord">
<li><p>Two-center models.
<li><p>The Folded Yukawa Potential.
<li><p>Generalized Woods-Saxon potentials.
</l>
```

This could be displayed as, for example

- Two-center models.
- The Folded Yukawa Potential.
- Generalized Woods-Saxon potentials.

In analogy with the sectional units, a recursive list structure has been implemented; see section 3.5.3. The presentation of lists is determined only by the `type` attribute and the nesting level. See the relevant typesetting instructions for the journal concerned for details about the presentation of this element.

6.9.1 List item

Opening tag: ``, mandatory.

Closing tag: ``, optional.

A list item consists of one or more paragraphs, and can be the target for cross-reference by means of `cross-ref`. If the list to which this list item belongs has the type `def`, the value of the attribute `id` of `li` is printed in front of the actual contents of the `li` element. Inside lists of type `ord`, `unord` or `tab` none of the `li` elements should have an `id` attribute.

6.10 Definition list

Opening tag: `<dl>`, mandatory.

Closing tag: `</dl>`, mandatory.

The definition list is a variation of the regular list. A definition list consists of an optional number (`no`), an optional heading (`st`), and one or more list items. Each list item consists of a definition term, `dl`, and an optional definition description, `dd`. The `dl` element consists of text, and has one optional attribute `id`, which is used for cross-references. The `dd` element consists of one or more paragraphs.

An example is given below:

```
<dl>
  <dt>United States<dd>Dollar
  <dt>France<dd>Franc
  <dt>Japan<dd>Yen
</dl>
```

This could be displayed as, for example

United States Dollar
France Franc
Japan Yen

6.11 Table

Opening tag: `<tbl>`, mandatory.

Closing tag: `</tbl>`, mandatory.

A table consists of an optional number, and optional caption, and zero or more table bodies or links to external entities. Table footnotes can occur anywhere within the table. A table can be the target for cross-reference by means of `cross-ref`.

The tag `<tbl>` does not generate a reference in the text. This must be generated with the tag `<cross-ref>`. If the value of the optional attribute `loc` is `float`, also the default value, the table is assumed to be a ‘floating’ table; a floating table is placed on the current page when possible, and otherwise on one of the next pages, depending on the algorithms of the processing application. If the value of this attribute is `display` it is a displayed table, which should be inserted at precisely the point in the document instance where it occurs, but on a line by itself.

The table has an identifier, which is given by the attribute `id`, and which can be referenced with `<cross-ref>`. The caption of a table consists of one or more paragraphs of text.

The body of a table can be regarded as a rectangular object, consisting of cells arranged in rows and columns. In the DTD it is described as consisting of rows, where each row consists of cells.

A table body (`tblbdy`) consists of one or more rows (`r`), and has four attributes that determine the column and row stubs.² The attributes are

- `top-stubs` is the number of rows, counted from the top of the table, that constitute the top column stubs;
- `left-stubs` is the number of columns, counted from the left-hand side of the table, that constitute the left row stubs;
- `bottom-stubs` is the number of rows, counted from the bottom of the table, that constitute the bottom column stubs;
- `right-stubs` is the number of columns, counted from the right-hand side of the table, that constitute the right row stubs.

Column (row) stubs are repeated when the table is split across a page along a horizontal (vertical) line.

A table row (`r`) consists of one or more columns or *cells* (`c`). All rows must be of equal length. In principle, every cell can have the same content as a paragraph of text. Individual cells can be empty, but also entire rows or columns.

In an abstract sense a cell consists of three parts:

1. the actual contents of the cell, i.e. the “inside” of the cell,
2. a border of white space around the contents, which we will call the “gutter” of the cell here,

² The term “stub” is explained in the Chicago Manual of Style [4], although only column stubs are described there.

Table 6.1: Legal values of attributes that specify a horizontal line or other ornament.

Attribute value	Symbol	Attribute value	Symbol
bar	—	tilde	⋃
tcub	⌒	rarr	→
bcub	⌓	larr	←
tsqb	⊐	harrl	↔
bcub	⌞	lharu	↵
circ	⌒	rharu	↶

3. the perimeter of the cell, which consists of four edges, namely the top, left, bottom and right edges.

Syntactically, a table cell consist of four border specifications, `top-border`, `left-border`, `bottom-border`, `right-border`, and the actual cell content. It has the following attributes:

- `cspan`, the number of spanned columns.
- `rspan`, the number of spanned rows.
- `ca`, the column alignment. Legal values of this attribute are `l` (left), `c` (center), `r` (right), `d` (decimal), `j` (justified), and `vmk` (vertical markers present; see explanation below). The default value is `l`.
- `ra`, the row alignment. Legal values of this attribute are `t` (top), `c` (center), `b` (bottom) and `j` (justified). Default value is `t`.

Within a column of a table, one can have alignment points indicated by a tag `<vmk>`. Within a cell one can have as many alignment points as one needs, but only if its horizontal alignment is specified as `vmk`.

The four empty elements `top-border`, `left-border`, `bottom-border`, `right-border`, define the borders of the cell. Each element has an attribute `type` and an attribute `style`, which together specify the type of rule.

The legal values of the `type` attribute of `top-border` and `bottom-border` are given in table 6.1. The legal values of the `type` attribute of `left-border` and `right-border` are given in the first column of table 6.2.

An example of table markup, and one possibility of representing it, is given in figure 6.1.

6.11.1 Caption

Opening tag: `<caption>`, mandatory.

Closing tag: `</caption>`, optional.

A caption describes the contents of the table as a whole, and consists of one or more paragraphs.

6.11.2 Table body

Opening tag: `<tblbdy>`, mandatory.

Closing tag: `</tblbdy>`, optional.

For a more detailed discussion of the internal structure of the table body and of the attributes associated with it, see above.

6.11.3 Table footnote

Opening tag: `<tblfn>`, mandatory.

Closing tag: `</tblfn>`, mandatory.

A table footnote consists of an optional number and one or more paragraphs. Table footnote can be the target for cross-reference by means of `cross-ref`. The `id` attribute is required for this element.

```

<tblbdy cstub="0" rstub="1">
  <r>
    <c><top-border><bottom-border>Platinum precursor</c>
    <c><top-border><bottom-border>Metal loading(%)</c>
    <c><top-border><bottom-border>H<inf>2</inf>/&mu;mol g cat</c>
    <c><top-border><bottom-border>Pt surface area/m<sup>2</sup> gcat</c>
    <c><top-border><bottom-border>Pt dispersion(%)</c>
  </r>
  <r>
    <c>DNDA-Pt</c>
    <c ca="d">0.1</c>
    <c ca="d">1.02</c>
    <c ca="d">0.10</c>
    <c ca="d">39</c>
  </r>
  <r>
    <c>DNDA-Pt</c>
    <c ca="d">0.5</c>
    <c ca="d">5.40</c>
    <c ca="d">0.52</c>
    <c ca="d">42</c>
  </r>
  <r>
    <c><bottom-border>DNDA-Pt</c>
    <c ca="d"><bottom-border>1</c>
    <c ca="d"><bottom-border>10.6</c>
    <c ca="d"><bottom-border>1.02</c>
    <c ca="d"><bottom-border>41</c>
  </r>
</tblbdy>

```

Platinum precursor	Metal loading(%)	H ₂ /μmol g cat	Pt surface area/m ² gcat	Pt dispersion(%)
DNDA-Pt	0.1	1.02	0.10	39
DNDA-Pt	0.5	5.40	0.52	42
DNDA-Pt	1	10.6	1.02	41

Figure 6.1: Example of table markup and presentation.

Table 6.2: Meaningful combinations of `type` and `style` attributes.

type	style								
	s	d	t	da	dot	b	bl	n	
<code>lpar</code>	(×	×				×	×	
<code>rpar</code>)	×	×				×	×	
<code>lsqb</code>	[×	×				×	×	
<code>rsqb</code>]	×	×				×	×	
<code>lcub</code>	{	×					×	×	
<code>rcub</code>	}	×					×	×	
<code>vb</code>		×	×	×	×	×	×	×	×
<code>lang</code>	<	×	×				×	×	
<code>rang</code>	>	×	×				×	×	
<code>sol</code>	/	×					×	×	
<code>bsol</code>	\	×					×	×	
<code>lceil</code>	⌈	×					×	×	
<code>rceil</code>	⌋	×					×	×	
<code>lfloor</code>	⌊	×					×	×	
<code>rfloor</code>	⌋	×					×	×	

6.12 Inline figure

Opening tag: `<inline-fig>`, mandatory.

Closing tag: `</inline-fig>`, mandatory.

This element consists of exactly one `link` element. An in-line figure, should be inserted at precisely the point in the document instance where it occurs.

6.13 Figure

Opening tag: `<fig>`, mandatory.

Closing tag: `</fig>`, mandatory.

A figure consists of an optional number, an optional caption, and zero or more links to external entities (figure bodies) or nested figures (i.e. sub-figures). The elements `link` and `figure` may occur in any order, they may all be repeated and they may be mixed. For example:

- `figure-link1 figure-link2 figure-link3`
- `figure1 figure-link1 figure2 figure-link2`

are all well-structured figures.

The tag `<fig>` does not generate a reference in the text. This must be generated with `<cross-ref>`. If the value of the optional attribute `loc` is `float`, also the default value, the figure is assumed to be a ‘floating’ figure; a floating figure is placed on the current page when possible, and otherwise on one of the next pages, depending on the algorithms of the processing application. If the value of this attribute is `display` it is a displayed figure, which should be inserted at precisely the point in the document instance where it occurs, but on a line by itself.

The figure has an identifier, which is given by the attribute `id`, and which can be referenced with `cross-ref`. The caption of a figure has as content one or more paragraphs of text.

6.13.1 Caption

Opening tag: <caption>, mandatory.

Closing tag: </caption>, optional.

A caption describes the contents of the figure as a whole, and consists of one or more paragraphs.

6.13.2 Figure

See 6.13.

6.14 Scheme

Opening tag: <scheme>, mandatory.

Closing tag: </scheme>, mandatory.

A scheme starts with an optional number and an optional caption. The rest of the scheme is a sequence of zero or more occurrences of either a link or a scheme (i.e. a sub-scheme). In previous versions of the DTD this was a variant of the `fig` element.

The element caption must, if present, precede the elements `link` and `scheme`. The elements `link` and `scheme` may occur in any order, they may be repeated and they may be mixed.

6.15 Plate

Opening tag: <plate>, mandatory.

Closing tag: </plate>, mandatory.

A plate starts with an optional number and an optional caption. The rest of the plate is a sequence of zero or more occurrences of either a link or a plate (i.e. a sub-plate). In previous versions of the DTD this was a variant of the `fig` element.

The element caption must, if present, precede the elements `link` and `plate`. The elements `link` and `plate` may occur in any order, they may be repeated and they may be mixed.

6.16 Text-box

Opening tag: <textbox>, mandatory.

Closing tag: </textbox>, mandatory.

A text-box starts with an optional number and an optional caption. The rest of the text-box is either a link, or a sequence of paragraphs or sections (similar to the body of the article). For example, a text-box that includes a complete (short) article uses a `link` element that refers to a complete SGML document.

6.17 Unprinted item

Opening tag: <upi>, mandatory.

Closing tag: </upi>, mandatory.

A `upi` element consists of an optional number, an optional caption, and zero or more links. It is used to refer to entities that are under control of the publisher, but that are not displayed in the printed version of the article (except perhaps in the form of a list of available unprinted items). The unprinted items can be shown in electronic products that incorporate the article.

6.18 Formula

6.18.1 Inline formula

Opening tag: `<f>`, mandatory.

Closing tag: `</f>`, mandatory.

In theory, an inline formula consists of text, just like a paragraph. However, in most cases an inline formula will contain a high proportion of mathematical constructions, such as e.g. fractions, roots and summations. It is not allowed to have displayed formulas appear inside inline formulas.

Most of the details of presentation of formula contents depend on the chosen medium and layout. See the relevant typesetting instructions for the journal concerned for details about in-line formulas. Some details, however, can be described independent of these factors.

- Inside displayed and in-line formulas, Latin and Greek letters are slanted by default.
- Multiple spaces in the document instance always count as one, i.e. also within formulas.
- Line-breaking, for example in the form of discretionary multiplication signs (\times), is not indicated in the document. One exception is formed by the occurrence of the entity ` ;`, which indicates a non-breaking space.

6.18.2 Displayed formula

Opening tag: `<fd>`, mandatory.

Closing tag: `</fd>`, mandatory.

A displayed formula has the same content, apart from the optional number element, as an in-line formula, but it differs in presentation. See the relevant typesetting instructions for the journal concerned for details about the presentation of displayed formulas.

A displayed formula that consists of one single line is not special in any way. The only thing that can be said about it is that it can carry an identification, usually a number, which is given by the `id` attribute. This number can also be used for referring to the formula with `<cross-ref>`. A displayed formula carries a number if and only if it has an `id` attribute.

A displayed formula can also consist of multiple formula lines. This is tagged as an `fd` element with nested `fd` elements, one for each line in the formula. In that case both the formula as a whole, the ‘formula group’, and the individual formula lines can carry a number. The formula lines are tagged by nested start tags `<fd>` and end tags `</fd>`. Nested `fd` elements, i.e. formula lines, are not treated differently in presentation, i.e. they are not indented horizontally or set off from the main body of the text by vertical space.

6.19 Elements for built-up text

Elements for built-up text are structures used in (mathematical) formulas. An example is the element `rad`, which is used to mark up roots. The use of these structures is rather complex and is covered below.

6.19.1 Superiors and inferiors

Superiors and inferiors are indicated with the tags `sup` and `inf`, respectively. Examples:

Element	Meaning	Sample input	Sample output
<code>sup</code>	superior	<code><f>x<sup>2</sup></f></code>	x^2
<code>inf</code>	inferior	<code><f>y<inf>k</inf></f></code>	y_k

Multiple consecutive `sup` and `inf` elements are allowed. There could be a slight difference in presentation between `a¹²` and `a¹²`.

The elements `sup` and `inf` have attributes `loc` and `arrange`. The first attribute can have values ‘pre’ (base element follows this element) and ‘post’ (base element precedes this element, default). So for example τ_{ij}^n should be marked up as follows

```
<sup pre>&prime;</sup>&tau;<sup>n</sup><inf>ij</inf>
```

The second attribute is ‘arrange’. If this is absent, the superior or inferior should be placed as usual, i.e. as close as possible to the base element. If the attribute is present, it can (for the time being) only have the value ‘stagger’. An example will perhaps illustrate the concept of ‘staggering’: $T^1_2^3$ would be marked up as follows

```
T<sup>1</sup><inf arrange="stagger">2</inf>
<sup arrange="stagger">3</sup>
```

6.19.2 Accent constructions

The accent construction, start tag `<a>` and end tag ``, is as in the old AAP DTD’s [6]. The element `a` consists of two sub-elements `ac`. The first sub-element is the accented character (*one* character only), and the second sub-element is the accent (*one* accent or mark only), which most often is an entity reference for a floating accent, e.g. `ˆ` for the circumflex accent.

The start tag `<a>` has an attribute `valign`, which can have the values `u` (up, accent above character, default), `m` (middle, accent strikes through character), and `d` (down, accent below character). Both the start tag and the end tag of `a` are mandatory. The start tag and end tag of its sub-elements, `ac`, are optional, but sufficient tags must be present to make the division in accented character and actual accent unambiguously clear.

Some examples are given in the table below:

Construct	Sample input	Sample output
‘Up’ accent	<code><a><ac>e<ac>&uml;</code>	ë
‘Down’ accent	<code><f><ac>x<ac>&macr;</f></code>	\underline{x}
Two accents	<code><f><a><ac><a><ac>x<ac>~<ac>&macr;</f></code>	\tilde{x}

6.19.3 Boxes, overlines and underlines

Constructs that are embellished with boxes, overlines and underlines are tagged as shown in the following example:

Tag name	Meaning	Sample input	Sample output
<code>box</code>	box	<code><f><box>a+b</box></f></code>	$\boxed{a+b}$
<code>ovl</code>	overline	<code><f><ovl>a+b</ovl></f></code>	$\overline{a+b}$
<code>unl</code>	underline	<code><f><unl>a+b</unl></f></code>	$\underline{a+b}$

These elements have two attributes, `type` and `style`. The `type` attribute is mandatory, and can have the values given in table 6.1.

The `style` attribute can have the values given in table 6.3, and specifies the kind of line drawn around, above, respectively below the enclosed material. The default value of this attribute is `s`. This attribute is also on the `fr` element (fraction), where it determines the line (bar) drawn between numerator and denominator, and in the separator attributes of tables and table cells (in the latter case the values ‘bl’ and ‘n’ are not allowed).

The mechanism for creating overlined and underlined elements only works when these constructs are properly nested. If non-nested constructs occur, these should be indicated with the tags given in the table below:

Construct	Start tag	End tag
Overline	<code><ov id="ABC"></code>	<code><ovr id="ABC"></code>
Underline	<code><un id="XYZ"></code>	<code><unr id="XYZ"></code>

For example: `<ov id="A">a+b<ovr id="A">` will create the same output as `<ovl>a+b</ovl>`. Another example: `<ovl>WX<un id="B">Y</ovl>Z<unr id="B">` should result in $\overline{WXY}Z$.

Table 6.3: Values of the style attribute.

Value	Meaning	Example
s	single	
d	double	
t	triple	
da	dashed	⋮
dot	dotted	⋮
b	bold	⦿
bl	blank	space between
n	none	no space between

6.19.4 Limit constructions

A limits construct is composed of a main symbol, the operator (element `op`), a lower limit (element `ll`), and an upper limit (element `ul`). The lower and upper limits are optional, but the operator is mandatory. The operand is not identified as such by means of tags. For example,

$$\bigcup_{k=1}^n x_n \cup y_n$$

would be marked up as follows

```
<fd>
<lim>&cup;<ll>k=1<ul>n</lim>x<inf>n</inf>&cup;y<inf>n</inf>
</fd>
```

The size of the operator and the positioning of the lower and upper limits depend on the context in which the `lim` construction appears. For example: in the denominator of a built-up fraction within a displayed formula, the operator symbol is small. Summations, products and integrals are special forms of limit constructions, which differ only in the choice of the operator.

6.19.5 Fences

Characters such as parentheses `()`, square brackets `[]`, or curly braces `{}`, that are used to set off parts of a formula, are collectively called fences. They are added as a construct here in order to enable automatic adjustment of their height to match the dimensions of the material between the fences. The delimiting symbol is specified by the `cp` element, which can appear at the begin or end of the fence construction, or any number of times inside the fence construction. There should be at least one `cp` element in each fence construction.

The details are as follows: the tags `<fen>` and `</fen>` do not generate any output themselves, but only delimit a scope. All delimiter symbols that occur within this scope should be tagged as `<cp>`. The height of a delimiter is the height of the fence of the same scope as the delimiter. The height of the fence is determined by the maximum height and depth of the contents of that fence construction.

The `cp` element is declared empty, i.e. it has no content and therefore no end-tag. It has two attributes, `type` and `style`. The `type` attribute is required and can have the values given in the first and second columns of table 6.2. The `style` attribute is optional and can have the values given in table 6.3; the default value of this attribute is `s`. It should be noted that not all combinations of these two attributes make sense; table 6.2 shows all meaningful combinations.

An example:

$$\langle \psi | H | \psi' \rangle$$

would be marked up as follows

```
<f><fen>
<cp type=lang>&psi;<cp type=vb>H<cp type=vb>&psi;&prime;<cp type=rang>
</fen></f>
```

6.19.6 Fractions

A fraction consists of two parts, a numerator and a denominator. Since both elements are required, and the numerator always comes first, it is permitted to omit the start tag and the end tag of the numerator, and add only the start tag for the denominator. The simplest form of a fraction construct therefore is (unless the numerator is empty of course) `<fr>numerator<de>denominator</fr>`.

An example:

$$\frac{2x + 3y}{12x - 12y}$$

would be marked up as

```
<f><fr>2x+3y<de>12x&minus;12y</fr></f>
```

The fraction bar itself is not tagged: it is implicit. The alignment of numerator and denominator with respect to the fraction bar, the type of fraction, and the type of fraction bar can be indicated by attributes on the start tag of the fraction construct. The first such attribute is `shape`, which can have values 'case', 'built' (built-up, the default value) and 'sol' (solidus). `fraction` depends on the context (small inside in-line formulas, large inside displayed formulas.) See the table below for examples:

Shape	Sample input	Sample output
case	<code><f><fr shape=case>1<de>2</fr></f></code>	$\frac{1}{2}$
built	<code><f><fr shape=built>2x<de>3y</fr></f></code>	$\frac{2x}{3y}$
sol	<code><f><fr shape=sol>2x<de>3y</fr></f></code>	$2x/3y$

The second attribute of the fraction construct is the `align` attribute, which can have values 'l' (left), 'c' (center, default) or 'r' (right). This indicates the type of alignment of numerator and denominator with respect to the fraction bar. The third and last attribute of the fraction construct is the `style` attribute, which has values and attached meanings as given in table 6.3 on page 49, and which specifies the 'style' of the fraction bar.

6.19.7 Radical

Radicals, or roots, are composed of a radicand and an optional index. Since the radicand element, start tag `<rcd>`, is required and always comes first, it is allowed to omit its start tag and end tag. If the index is needed, only the start tag `<rdx>` is required. The following table gives some simple examples of radical (root) constructions:

Sample input	Sample output
<code><f><rad>2</rad></f></code>	$\sqrt{2}$
<code><f><rad><rcd>a+b</rad></f></code>	$\sqrt{a+b}$
<code><f><rad>a+b<rdx>3</rad></f></code>	$\sqrt[3]{a+b}$

6.19.8 Arrays

An array (element `ar`) is a rectangular scheme, consisting of one or more rows. Each row consists of one or more cells. In principle, each cell can have the same content as a paragraph of text, but in practice the content will usually be a formula (small or large), or empty. See the table constructions for an in-depth discussion of this construct and its attributes. There is no *a priori* difference between tables and arrays, and there are no precise rules as to when to use one or the other. In combination with fences the array construct can be used to create matrices, for example:

```
<fd>
<fen><cp type=lpar><ar>
<r><c>x<c>&minus;y
<r><c>y<c>x
</ar><cp type=rpar></fen>
</fd>
```

results in the following output:

$$\begin{pmatrix} x & -y \\ y & x \end{pmatrix}$$

6.19.9 Miscellaneous

6.19.9.1 Horizontal and vertical space

Should the need arise to indicate explicitly the insertion of wide or thin spaces, which can be the case, for example, in displayed mathematical formulas, there is a mechanism in the DTD to indicate horizontal or vertical spacing. For this one uses the elements `hsp` or `vsp`, which do not have content and therefore no corresponding end tag. The start-tags `<hsp>` and `<vsp>` have one attribute, `sp`, which has a numerical value. For the `hsp` element, the value of the `sp` attribute is the number of “em’s” that needs to be inserted (default: 1.0), where one “em” is the width of the capital letter ‘M’ in the current font. For the `vsp` element, the spacing is in terms of the baseline-to-baseline distance.

Some remarks about details of vertical space:

- If `<vsp sp=1.5>` occurs in running text, e.g. in the middle of a sentence, this should be displayed as follows: move 1.5 em down, do not start on a new line.
- Extra vertical spacing between rows in a table is obtained by placing `vsp` elements in one cell of the table.

6.19.9.2 Arrow

The arrow element is not used at present.

6.20 Font changes

All tags for font change enclose text. The opening tag changes the base font, and the mandatory closing tag returns the font to the original base font. Therefore all opening and closing tags for font changes are mandatory. In order to obtain “To change **text to bold**, and revert to roman”, one would use the `` and `` tags as in the following example:

To change `text to bold`, and revert to roman.....

In principle, font changes can be embedded, e.g.

...`<it>`tags enclose `text</it>`. The ...

which would be printed as

...tags enclose **text**. The ...

However, not all combinations of font changes that are theoretically possible produce meaningful or useful results. For a detailed discussion of this issue see [11].

The font changes that are defined by the DTD are given in table 6.4. They can be used anywhere in the document, with one exception, namely `<rm>`, which can only be used in formulas. In normal text, all letters, latin and greek, have the default shape ‘upright’ (‘roman’). In most journals, all letters inside formulae, latin and greek, have the default shape ‘slanted’ (‘italic’). Therefore, the font change `<rm>` is used in formulas only, to generate letters or words in roman font. It is useless in normal running text, since running text is printed in a roman font by default.

Table 6.4: Font changes.

Tag name	Meaning	Sample input	Sample output
b	boldface	P (x)	P (x)
it	italic	<it>any</it>	<i>any</i>
of	openface	<of>Z</of>	Z
sc	script	<sc>L</sc>	L
ge	german	<ge>g</ge>	g
ssf	sans-serif	<ssf>A</ssf>	A
ty	typewriter	<ty>var</ty>	var
scp	small caps	<scp>Goldfarb</scp>	GOLDFARB
rm	roman	<f>N<inf><rm>white</rm></inf></f>	<i>N</i> _{white}

Appendix A

Future enhancements

The following topics, dealing with possible additions or modifications to the present version of the DTD, are currently under investigation:

1. Chemical formulas. Definitions for chemical formulas are not included in the DTD. In the present version of the DTD, chemical formulas should be included in an article as illustrations.
2. Commutative diagrams.
3. Alignment in displayed mathematical formulas.

During design of the DTD we strived for maximum compatibility with other standards. Efforts have been made to achieve compatibility in naming conventions with the AAP¹ DTD ([6], now made obsolete by the new ISO standard 12083, [7]) or with the MAJOUR DTD, developed by the European Working Group on SGML. Whenever the DTD is modified, we will attempt to maintain or achieve this compatibility.

1. AAP stands for 'Association of American Publishers'.

Appendix B

Entity management

From the present release onwards, we propose that users of the DTDs defined in this release will use catalogs for entity management. This has been defined in [10].

An example catalog is given below.

```
SGMLDECL "art400.dcl"  
PUBLIC "-//ES/DTD full length article//EN" "art400.dtd"  
PUBLIC "-//ES/ENTITIES special characters//EN" "art400.ent"  
  
SYSTEM "GR1" "GR1.EPS"  
ENTITY myfile art400.dtd  
SYSTEM "xxx" "yyy"
```

Appendix C

SGML declaration

The document type definitions described in this report do not conform to the Reference Concrete Syntax [3]. The first difference is that the 'base set' of the concrete syntax is ASCII, not ISO 646:1983. In practice, this means that the dollar sign is used instead of the currency sign.

Furthermore, in order to be able to parse the present version of the DTDs (version DTDversion), several quantities under the heading SYNTAX in the Reference Concrete Syntax must be changed. For example, the quantity GRPGTCNT must be increased from 96 to 238 for the article DTD, and the quantity NAMELEN must be increased to 17 to accommodate the names of some of the more recent elements.

Since there is no algorithm for computing capacity points, and since capacity points depend on the document instance, we have decided to use the reference declaration of these parameters. If necessary for a particular document and application, a custom declaration can be derived from the ones we include with the present release, and use this customized declaration instead.

The SGML declarations to be used with the present version of the DTDs are distributed together with the DTDs, in separate files. Each DTD has its own declaration. The SGML declaration for the article DTD is printed below.

Although this declaration permits the use of various forms of minimization, current practice within Elsevier Science is to use no minimization, except possible omission of start tags, end tags and optional attributes, where these can be inferred by an SGML parser. Also, we consistently use semi-colons to delimit entity references.

```
<!SGML "ISO 8879:1986"
```

```
CHARSET
  BASESET      "ISO 646:1983//CHARSET International Reference Version (IRV)//ESC 2/5 4/0"
  DESCSET      0 9 UNUSED
               9 2 9
               11 2 UNUSED
               13 1 13
               14 18 UNUSED
               32 95 32
               127 1 UNUSED

CAPACITY
  PUBLIC      "ISO 8879:1986//CAPACITY Reference//EN"

SCOPE
  DOCUMENT

SYNTAX
  SHUNCHAR    CONTROLS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
               18 19 20 21 22 23 24 25 26 27 28 29 30 31 127

  BASESET      "ISO 646:1983//CHARSET International Reference Version (IRV)//ESC 2/5 4/0"
  DESCSET      0 128 0
  FUNCTION     RE 13
               RS 10
               SPACE 32
               TAB SEPCHAR 9

  NAMING
  LCNMSTRT    ""
  UCNMSTRT    ""
  LCNMCHAR    "- ."
  UCNMCHAR    "- ."
  NAMECASE    GENERAL YES
               ENTITY NO

  DELIM
  GENERAL     SGMLREF
  SHORTREF   SGMLREF
```

NAMES	SGMLREF
QUANTITY	SGMLREF
	NAMELEN 17
	LITLEN 718
	GRPCNT 238
	GRPGTCNT 154
	ATTCNT 240
	TAGLVL 100
FEATURES	
MINIMIZE	DATATAG NO
	OMITTAG YES
	RANK NO
	SHORTTAG YES
LINK	SIMPLE NO
	IMPLICIT NO
	EXPLICIT NO
OTHER	CONCUR NO
	SUBDOC YES 100
	FORMAL NO
APPINFO	
NONE>	

Appendix D

Document type definition for articles

```
<!-- Elsevier Science Full Length Article DTD version 4.0.0

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provided this notice is included in all copies, but changing it is not allowed.

Typical invocation:
<!DOCTYPE art PUBLIC "-//ES/DTD full length article DTD version 4.0.0//EN" []>
-->

<!-- notations -->

<!NOTATION TEXT PUBLIC "-//ES/NOTATION text format//EN">
<!NOTATION IMAGE PUBLIC "-//ES/NOTATION image format//EN">
<!NOTATION AUDIO PUBLIC "-//ES/NOTATION audio format//EN">
<!NOTATION VIDEO PUBLIC "-//ES/NOTATION video format//EN">
<!NOTATION APPLICATION PUBLIC "-//ES/NOTATION application format//EN">

<!-- data entities -->

<!ENTITY % font-change "(b|it|rm|of|sc|ge|ssf|ty|scp)" >
<!ENTITY % inline "(f|sup|inf|a|ovl|ov|ovr|unl|un|unr|lim|fen|box|fr|rad|ar|
arrow|hsp|vsp|inline-fig)" >
<!ENTITY % display "(fd|tbl|fig|scheme|plate|textbox|upi|l|dl|qd|enun)" >
<!ENTITY % data "(#PCDATA|%font-change;|%inline;|%display;|fn|anchor|
cross-ref|intra-ref|inter-ref)*" >

<!-- content model entities -->

<!ENTITY % name "( snm, fnm?, jr? )" >
<!ENTITY % text "( p | sec )+" >
<!ENTITY % titles "( ( title, translated-title? ) | translated-title )" >

<!-- attribute type entities -->

<!ENTITY % abs-class "(author|editor|inspec|teaser)" >
<!ENTITY % accent-pos "(u|m|d)" >
<!ENTITY % arrange "(staggered)" >
<!ENTITY % country "(ad|ae|af|ag|ai|al|am|an|ao|aq|ar|as|at|au|aw|az|ba|bb|bd|be|bf|bg|bh|...)" >
<!ENTITY % cpyrt-type "(full-transfer|limited-transfer|no-transfer|unknown|us-gov|
crown|society|other)" >
<!ENTITY % docsubty "(abs|add|adv|ann|cal|cnf|cor|dis|edi|err|fla|lit|mis|nws|pnt|prp|prv|pub|
rev|sco|ssu)" >
<!ENTITY % fr-align "(l|c|r)" >
<!ENTITY % halign "(l|c|r|j|d|vmk)" >
<!ENTITY % hline "(bar|tcub|bcub|tsqb|bsqb|circ|tilde|larr|rarr|harr|lharu|rharu)" >
<!ENTITY % kwd-class "(kwd|abr|jel|msc|pacs|mat|src|idt|psychinfo|neurosci)" >
<!ENTITY % language "(de|en|es|fr|pt|ru)" >
<!ENTITY % list-type "(ord|unord|tab)" >
<!ENTITY % loc "(pre|post)" >
<!ENTITY % location "(display|float)" >
<!ENTITY % locator-type "(url|urn|xxx-archive|cern)" >
<!ENTITY % object-type "(preprint|embase|geobase)" >
<!ENTITY % shape "(built|case|sol)" >
<!ENTITY % style "(s|d|t|da|dot|b|bl|n)" >
```

```

<!ENTITY % valign "(t|m|b|vj)" >
<!ENTITY % vline "(lpar|rpar|lsqb|rsqb|lcub|rcub|lang|rang|vb|sol|bsol|lceil|rceil|lfloor|rfloor)" >

<!-- article -->

<!ELEMENT      art          - o          ( copyright, dochead?, doctopic?, fm, bdy?, bm? )>
<!ATTLIST     art
  version      NUTOKEN          #FIXED "4.0.0"
  jid          NMTOKEN          #REQUIRED
  aid          NMTOKEN          #REQUIRED
  pii          NMTOKEN          #IMPLIED
  docsubty     %docsubty;       fla
  language     %language;       en
  refers-to    NMTOKEN          #IMPLIED>

<!-- copyright -->

<!ELEMENT      copyright    - o          ( %data; )>
<!ATTLIST     copyright
  type         %cpyrt-type;     #REQUIRED
  yr           NUMBER           #REQUIRED>

<!-- document header, e.g. "Short Communication" -->

<!ELEMENT      dochead      - o          ( %data; )>

<!-- document topic, e.g. "Particle Physics" -->

<!ELEMENT      doctopic     - o          ( %data; )>

<!-- article front matter -->

<!ELEMENT      fm           - o          ( atlfn*, atl*, prs?, ded?, aug*, re?, rv*, acc?,
  misc?, abs*, kwdg*, nomenclature? )>
<!ELEMENT      atlfn        - o          ( %data; )>
<!ELEMENT      atl          - o          ( %data;, sbt? )>
<!ATTLIST     atl
  language     %language;       #IMPLIED>
<!ELEMENT      sbt          - o          ( %data; )>
<!ELEMENT      prs          - o          ( %data; )>
<!ELEMENT      ded          - o          ( %data; )>
<!ELEMENT      aug          - o          ( ( ( collab | au ), cross-ref*, cor?, ead* )+,
  aff* )>
<!ELEMENT      collab       - o          ( index?, %data;, caff? )>
<!ELEMENT      caff         - o          ( %data; )>
<!ELEMENT      au           - o          ( degs?, ( fnm? & snm ), jr?, degs?, roles? )>
<!ELEMENT      degs         - o          ( %data; )>
<!ELEMENT      fnm          - o          ( inits?, %data; )>
<!ELEMENT      inits        - o          ( %data; )>
<!ELEMENT      snm          - o          ( index?, %data; )>
<!ELEMENT      index        - o          ( %data; )>
<!ELEMENT      jr           - o          ( %data; )>
<!ELEMENT      roles        - o          ( %data; )>
<!ELEMENT      cor          - o          ( %data; )>
<!ELEMENT      ead          - o          ( %data; )>
<!ELEMENT      aff          - o          ( no?, %data;, ( cty, %data; )?, cny, %data; )>
<!ATTLIST     aff
  id           ID               #IMPLIED>
<!ELEMENT      no           - o          ( %data; )>
<!ELEMENT      cty          - -          ( %data; )>
<!ELEMENT      cny          - -          ( %data; )>
<!ATTLIST     cny
  cny-code     %country;        #IMPLIED>
<!ELEMENT      re           - o          EMPTY>
<!ATTLIST     re
  day          NUMBER           #REQUIRED
  mo           NUMBER           #REQUIRED
  yr           NUMBER           #REQUIRED>
<!ELEMENT      rv           - o          EMPTY>
<!ATTLIST     rv
  day          NUMBER           #REQUIRED
  mo           NUMBER           #REQUIRED

```

```

    yr                NUMBER                #REQUIRED>
<!ELEMENT            acc                    - o                    EMPTY>
<!ATTLIST            acc
    day              NUMBER                #REQUIRED
    mo               NUMBER                #REQUIRED
    yr               NUMBER                #REQUIRED>
<!ELEMENT            misc                   - o                    ( %data; )>
<!ELEMENT            abs                    - o                    ( %text; )>
<!ATTLIST            abs
    class            %abs-class;          #IMPLIED
    language         %language;          #IMPLIED>
<!ELEMENT            p                      - o                    ( %data; )>
<!ELEMENT            kwdg                   - o                    ( kwd+ )>
<!ATTLIST            kwdg
    class            %kwd-class;          kwd
    language         %language;          #IMPLIED>
<!ELEMENT            kwd                    - -                    ( %data; , kwd* )>
<!ELEMENT            nomenclature          - o                    ( dl+ )>

<!-- article body -->

<!ELEMENT            bdy                    - o                    ( salutation?, %text; )>
<!ELEMENT            salutation            - o                    ( %data; )>
<!ELEMENT            sec                   - -                    ( no?, st?, %text; )>
<!ATTLIST            sec
    id               ID                  #IMPLIED>
<!ELEMENT            st                    - o                    ( %data; )>

<!-- article back matter -->

<!ELEMENT            bm                    - o                    ( ack?, appm?, bibl*, further-reading*,
    glossary*, vt* )>

<!-- acknowledgement -->

<!ELEMENT            ack                   - o                    ( p+ )>

<!-- bibliography -->

<!ELEMENT            bibl                  - o                    ( st?, bib+ )>
<!ELEMENT            bib                   - o                    ( no?, ( bb | other-ref ) )>
<!ATTLIST            bib
    id               ID                  #IMPLIED>
<!ELEMENT            bb                    - o                    ( contribution?, host+ )>
<!ELEMENT            contribution          - o                    ( authors?, (%titles;)?, comment? )>
<!ELEMENT            authors              - o                    ( collab | ( author+, et-al? ) )>
<!ELEMENT            author               - o                    ( %name; )>
<!ELEMENT            et-al                - o                    EMPTY >
<!ELEMENT            title                - o                    ( %data;, sbt? )>
<!ATTLIST            title
    language         %language;          #IMPLIED>
<!ELEMENT            translated-title      - o                    ( %data;, sbt? )>
<!ELEMENT            comment              - o                    ( %data; )>
<!ELEMENT            host                 - o                    ( ( issue | book | edited-book | e-host ),
    comment? )>
<!ELEMENT            issue                - o                    ( editors?, (%titles;)?, conference?, series,
    issue-nr?, date, pages? )>
<!ELEMENT            conference           - o                    ( %data; )>
<!ELEMENT            editors              - o                    ( editor+, et-al? )>
<!ELEMENT            editor               - o                    ( %name; )>
<!ELEMENT            series               - o                    ( (%titles;), volume-nr? )>
<!ELEMENT            volume-nr            - o                    ( %data; )>
<!ELEMENT            issue-nr             - o                    ( %data; )>
<!ELEMENT            date                 - o                    ( %data; )>
<!ELEMENT            pages                - o                    ( first-page, last-page? )>
<!ELEMENT            first-page           - o                    ( %data; )>
<!ELEMENT            last-page            - o                    ( %data; )>
<!ELEMENT            book                  - o                    ( (%titles;)?, edition?, book-series?, date+,
    publisher? )>
<!ELEMENT            edition              - o                    ( %data; )>
<!ELEMENT            publisher            - o                    ( name, location? )>
<!ELEMENT            name                  - o                    ( %data; )>

```

```

<!ELEMENT      location      - o      ( %data; )>
<!ELEMENT      edited-book   - o      ( editors?, (%titles;)?, conference?, edition?,
      book-series?, date+, pages?, publisher? )>
<!ELEMENT      book-series   - o      ( editors?, series )>
<!ELEMENT      e-host        - o      ( inter-ref?, date? )>
<!ELEMENT      other-ref     - o      ( %data; )>

<!-- further reading -->

<!ELEMENT      further-reading - o      ( st?, bib+ )>

<!-- appendix -->

<!ELEMENT      appm          o o      ( app+ )>
<!ELEMENT      app           - o      ( no?, st?, %text; )>
<!ATTLIST      app
      id          ID          #IMPLIED>

<!-- glossary -->

<!ELEMENT      glossary      - o      ( st?, glossary-entry+ )>
<!ELEMENT      glossary-entry - o      ( glossary-heading, glossary-def*, cross-ref*,
      glossary-entry* )>
<!ATTLIST      glossary-entry
      id          ID          #IMPLIED>
<!ELEMENT      glossary-heading - o      ( %data;, glossary-heading* )>
<!ELEMENT      glossary-def     - o      ( %data; )>

<!-- vita -->

<!ELEMENT      vt            - o      ( p+ )>
<!ATTLIST      vt
      id          ID          #IMPLIED
      picture     ENTITY     #IMPLIED>

<!-- footnote -->

<!ELEMENT      fn            - -      ( no?, p+ )>
<!ATTLIST      fn
      id          ID          #REQUIRED>

<!-- anchor in text, the target of e.g. a cross-ref -->

<!ELEMENT      anchor        - -      ( %data; )>
<!ATTLIST      anchor
      id          ID          #REQUIRED>

<!-- displayed quotation -->

<!ELEMENT      qd            - -      ( p+ )>

<!-- enunciation -->

<!ELEMENT      enun          - -      ( no?, st?, p+ )>
<!ATTLIST      enun
      id          ID          #IMPLIED>

<!-- reference to objects in this document -->

<!ELEMENT      cross-ref     - -      ( %data; )>
<!ATTLIST      cross-ref
      refid       IDREFS     #REQUIRED>

<!-- embedded reference to local external entity, e.g. in FIG -->

<!ELEMENT      link          - o      EMPTY>
<!ATTLIST      link
      locator     ENTITY     #REQUIRED>

<!-- reference to local external entity -->

<!ELEMENT      intra-ref     - -      ( %data; )>

```

```

<!ATTLIST      intra-ref
               refid      NAME          #IMPLIED
               locator    ENTITY       #REQUIRED
               object-type %object-type; #IMPLIED>

<!-- reference to global external entity -->

<!ELEMENT      inter-ref      - -          ( %data; )>
<!ATTLIST      inter-ref
               refid      NAME          #IMPLIED
               locator    CDATA        #IMPLIED
               locator-type %locator-type; #IMPLIED
               object-type %object-type; #IMPLIED>

<!-- list -->

<!ELEMENT      l              - -          ( no?, st?, li+ )>
<!ATTLIST      l
               id          ID          #IMPLIED
               type        %list-type;  #REQUIRED>
<!ELEMENT      li             - o          ( no?, p+ )>
<!ATTLIST      li
               id          ID          #IMPLIED>

<!-- definition list -->

<!ELEMENT      dl             - -          ( no?, st?, ( dt, dd? )+ )>
<!ATTLIST      dl
               id          ID          #IMPLIED>
<!ELEMENT      dt             - o          ( %data; )>
<!ATTLIST      dt
               id          ID          #IMPLIED>
<!ELEMENT      dd             - o          ( p+ )>

<!-- table -->

<!ELEMENT      tbl             - -          ( no?, caption?, ( link | tblbdy )* )+( tblfn )>
<!ATTLIST      tbl
               id          ID          #IMPLIED
               loc          %location;  float>
<!ELEMENT      caption        - o          ( p+ )>
<!ELEMENT      tblbdy         - o          ( r+ )>
<!ATTLIST      tblbdy
               top-stubs   NUMBER    0
               left-stubs  NUMBER    0
               bottom-stubs NUMBER    0
               right-stubs NUMBER    0>
<!ELEMENT      r              - o          ( c+ )>
<!ELEMENT      c              - o          ( top-border?, left-border?, bottom-border?,
               right-border?, %data; )+( vmk )>
<!ATTLIST      c
               cspan      NUMBER    1
               rspan      NUMBER    1
               ca          %halign;  1
               ra          %valign;  t>

<!ELEMENT      top-border     - o          EMPTY>
<!ATTLIST      top-border
               type        %hline;  bar
               style      %style;    s>

<!ELEMENT      left-border    - o          EMPTY>
<!ATTLIST      left-border
               type        %vline;  vb
               style      %style;    s>

<!ELEMENT      bottom-border  - o          EMPTY>
<!ATTLIST      bottom-border
               type        %hline;  bar
               style      %style;    s>

<!ELEMENT      right-border   - o          EMPTY>

```

```

<!ATTLIST      right-border
               type          %vline;      vb
               style         %style;      s>

<!-- vertical mark, only allowed in cell data and only if ca="vmk" -->

<!ELEMENT      vmk          - o          EMPTY>

<!-- table footnote -->

<!ELEMENT      tblfn      - -          ( no?, p+ )>
<!ATTLIST      tblfn
               id          ID          #REQUIRED>

<!-- inline figure -->

<!ELEMENT      inline-fig  - -          ( link )>

<!-- figure -->

<!ELEMENT      fig        - -          ( no?, caption?, ( link | fig ) * )>
<!ATTLIST      fig
               id          ID          #IMPLIED
               loc         %location;   float>

<!-- scheme -->

<!ELEMENT      scheme     - -          ( no?, caption?, ( link | scheme ) * )>
<!ATTLIST      scheme
               id          ID          #IMPLIED
               loc         %location;   float>

<!-- plate -->

<!ELEMENT      plate      - -          ( no?, caption?, ( link | plate ) * )>
<!ATTLIST      plate
               id          ID          #IMPLIED
               loc         %location;   float>

<!-- text box or SGML sub-document -->

<!ELEMENT      textbox    - -          ( no?, caption?, ( link | %text; ) )>
<!ATTLIST      textbox
               id          ID          #IMPLIED
               loc         %location;   float>

<!-- unprinted item -->

<!ELEMENT      upi        - -          ( no?, caption?, link* )>
<!ATTLIST      upi
               id          ID          #IMPLIED
               loc         %location;   float>

<!-- displayed formula -->

<!ELEMENT      fd         - -          ( no?, %data; )>
<!ATTLIST      fd
               id          ID          #IMPLIED>

<!-- inline formula -->

<!ELEMENT      f          - -          ( %data; ) -( fd )>

<!-- built-up text, uses <r> from <tbl> -->

<!ELEMENT      sup        - -          ( %data; )>
<!ATTLIST      sup
               loc         %loc;        #IMPLIED
               arrange     %arrange;    #IMPLIED>
<!ELEMENT      inf        - -          ( %data; )>
<!ATTLIST      inf
               loc         %loc;        #IMPLIED

```

```

arrange          %arrange;          #IMPLIED>
<!ELEMENT       a                    - -          ( ac, ac )>
<!ATTLIST      a
  valign         %accent-pos;       u>
<!ELEMENT       ac                   o o          ( %data; )>
<!ELEMENT       ovl                  - -          ( %data; )>
<!ATTLIST      ovl
  type           %hline;             #REQUIRED
  style          %style;             s>
<!ELEMENT       ov                    - o          EMPTY>
<!ATTLIST      ov
  id             ID                   #REQUIRED
  type           %hline;             #REQUIRED
  style          %style;             s>
<!ELEMENT       ovr                   - o          EMPTY>
<!ATTLIST      ovr
  refid         IDREF                #REQUIRED>
<!ELEMENT       unl                   - -          ( %data; )>
<!ATTLIST      unl
  type           %hline;             #REQUIRED
  style          %style;             s>
<!ELEMENT       un                    - o          EMPTY>
<!ATTLIST      un
  id             ID                   #REQUIRED
  type           %hline;             #REQUIRED
  style          %style;             s>
<!ELEMENT       unr                   - o          EMPTY>
<!ATTLIST      unr
  refid         IDREF                #REQUIRED>
<!ELEMENT       lim                   - -          ( op, ll?, ul? )>
<!ELEMENT       op                    o o          ( %data; )>
<!ELEMENT       ll                    - o          ( %data; )>
<!ELEMENT       ul                    - o          ( %data; )>
<!ELEMENT       fen                   - -          ( %data;, ( cp, %data; )+ )>
<!ELEMENT       cp                    - o          EMPTY>
<!ATTLIST      cp
  type           %vline;             #REQUIRED
  style          %style;             s>
<!ELEMENT       box                   - -          ( %data; )>
<!ATTLIST      box
  style          %style;             s>
<!ELEMENT       fr                    - -          ( nu, de )>
<!ATTLIST      fr
  shape         %shape;             built
  align         %fr-align;          c
  style          %style;             s>
<!ELEMENT       nu                    o o          ( %data; )>
<!ELEMENT       de                    - o          ( %data; )>
<!ELEMENT       rad                   - -          ( rcd, rdx? )>
<!ELEMENT       rcd                   o o          ( %data; )>
<!ELEMENT       rdx                   - o          ( %data; )>
<!ELEMENT       ar                    - -          ( r+ )>
<!ELEMENT       arrow                 - -          ( %data; )>
<!ELEMENT       hsp                   - o          EMPTY>
<!ATTLIST      hsp
  sp            NUTOKEN              "1.0">
<!ELEMENT       vsp                   - o          EMPTY>
<!ATTLIST      vsp
  sp            NUTOKEN              "1.0">

<!-- font change -->

<!ELEMENT       b                    - -          ( %data; )>
<!ELEMENT       it                   - -          ( %data; )>
<!ELEMENT       of                    - -          ( %data; )>
<!ELEMENT       sc                    - -          ( %data; )>
<!ELEMENT       ge                    - -          ( %data; )>
<!ELEMENT       ssf                   - -          ( %data; )>
<!ELEMENT       ty                    - -          ( %data; )>
<!ELEMENT       scp                   - -          ( %data; )>
<!ELEMENT       rm                    - -          ( %data; )>

```

```
<!-- character set -->
```

```
<!ENTITY % es-chars PUBLIC "-//ES/ENTITIES special characters version 4.0.0//EN">  
%es-chars;
```

Appendix E

Document type definition for indexes

```
<!-- Elsevier Science Index DTD version 1.0.0

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provided this notice is included in all copies, but changing it is not allowed.

Typical invocation:
<!DOCTYPE index PUBLIC "-//ES/DTD index DTD version 1.0.0//EN" []>
-->

<!-- notations -->

<!NOTATION TEXT PUBLIC "-//ES/NOTATION text format//EN">
<!NOTATION IMAGE PUBLIC "-//ES/NOTATION image format//EN">

<!-- data entities -->

<!ENTITY % font-change "(b|it|rm|of|sc|ge|ssf|ty|scp)" >
<!ENTITY % inline "(f|sup|inf|a|ovl|ov|ovr|unl|un|unr|lim|fen|box|fr|rad|ar|
arrow|hsp|vsp|inline-fig)" >
<!ENTITY % data "(#PCDATA|%font-change;|%inline;|cross-ref)*" >

<!ENTITY % accent-pos "(u|m|d)" >
<!ENTITY % arrange "(staggered)" >
<!ENTITY % fr-align "(l|c|r)" >
<!ENTITY % halign "(l|c|r|j|d|vmk)" >
<!ENTITY % hline "(bar|tcub|bcub|tsqb|bsqb|circ|tilde|larr|rarr|harr|lharu|rharu)" >
<!ENTITY % language "(de|en|es|fr|pt|ru)" >
<!ENTITY % loc "(pre|post)" >
<!ENTITY % locator-type "(url|urn|xxx-archive|cern)" >
<!ENTITY % object-type "(preprint|embase|geobase)" >
<!ENTITY % shape "(built|case|sol)" >
<!ENTITY % style "(s|d|t|da|dot|b|bl|n)" >
<!ENTITY % valign "(t|m|b|vj)" >
<!ENTITY % vline "(lpar|rpar|lsqb|rsqb|lcub|rcub|lang|rang|vb|sol|bsol|lceil|rceil|lfloor|rfloor)" >

<!-- index -->

<!ELEMENT index - - ( title?, sources?, indexer?, abbreviations?,
index-entry+ )>

<!ATTLIST index
version NUTOKEN #FIXED "1.0.0"
pii NMTOKEN #REQUIRED
language %language; en>

<!-- title of the index -->

<!ELEMENT title - o ( %data; )>

<!-- sources that the index refers to -->

<!ELEMENT sources - o ( %data; )>

<!-- name of the indexer, may also contain text like "Compiled by" -->
```

```

<!ELEMENT      indexer      - o          ( %data; )>
<!-- abbreviations used in the index -->
<!ELEMENT      abbreviations - o          ( %data; )>
<!-- index entry -->
<!ELEMENT      index-entry  - -          ( index-heading, locr*, cross-ref*, index-entry* )>
<!ATTLIST      index-entry
  id            ID            #IMPLIED>
<!-- index heading -->
<!ELEMENT      index-heading - -          ( %data;, index-heading* )>
<!-- reference to a location in an external document -->
<!ELEMENT      locr         - -          ( inter-ref?, intra-ref?, volume-nr?, issue-nr?,
  pages?, comment? )>
<!ELEMENT      volume-nr   - o          ( %data; )>
<!ELEMENT      issue-nr    - o          ( %data; )>
<!ELEMENT      pages       - o          ( first-page, last-page? )>
<!ELEMENT      first-page  - o          ( %data; )>
<!ELEMENT      last-page   - o          ( %data; )>
<!ELEMENT      comment     - o          ( %data; )>
<!-- reference to objects in this document, i.e. index entry -->
<!ELEMENT      cross-ref   - -          ( %data; )>
<!ATTLIST      cross-ref
  cross-ref     IDREFS       #REQUIRED>
  refid
<!-- inline figure -->
<!ELEMENT      inline-fig  - -          ( link )>
<!ELEMENT      link        - o          EMPTY>
<!ATTLIST      link
  link          ENTITY       #REQUIRED>
  locator
<!-- reference to local external entity, e.g. an article -->
<!ELEMENT      intra-ref   - -          ( %data; )>
<!ATTLIST      intra-ref
  refid         NAME         #IMPLIED
  locator       ENTITY       #REQUIRED
  object-type   %object-type; #IMPLIED>
<!-- reference to global external entity -->
<!ELEMENT      inter-ref   - -          ( %data; )>
<!ATTLIST      inter-ref
  refid         NAME         #IMPLIED
  locator       CDATA        #IMPLIED
  locator-type  %locator-type; #IMPLIED
  object-type   %object-type; #IMPLIED>
<!-- inline formula, no exclusion of FD -->
<!ELEMENT      f           - -          ( %data; )>
<!-- built-up text, with model of <c> added -->
<!ELEMENT      sup         - -          ( %data; )>
<!ATTLIST      sup
  sup          - -          #IMPLIED
  loc          %loc;        #IMPLIED
  arrange      %arrange;    #IMPLIED>
  inf
<!ELEMENT      inf         - -          ( %data; )>
<!ATTLIST      inf
  inf          - -          #IMPLIED
  loc          %loc;        #IMPLIED
  arrange      %arrange;    #IMPLIED>

```

```

<!ELEMENT      a          - -          ( ac, ac )>
<!ATTLIST     a
  valign      %accent-pos;  u>
<!ELEMENT     ac          o o          ( %data; )>
<!ELEMENT     ovl        - -          ( %data; )>
<!ATTLIST     ovl
  type        %hline;      #REQUIRED
  style       %style;      s>
<!ELEMENT     ov          - o          EMPTY>
<!ATTLIST     ov
  id          ID            #REQUIRED
  type       %hline;      #REQUIRED
  style      %style;      s>
<!ELEMENT     ovr        - o          EMPTY>
<!ATTLIST     ovr
  refid      IDREF        #REQUIRED>
<!ELEMENT     unl        - -          ( %data; )>
<!ATTLIST     unl
  type       %hline;      #REQUIRED
  style      %style;      s>
<!ELEMENT     un         - o          EMPTY>
<!ATTLIST     un
  id         ID            #REQUIRED
  type      %hline;      #REQUIRED
  style     %style;      s>
<!ELEMENT     unr        - o          EMPTY>
<!ATTLIST     unr
  refid     IDREF        #REQUIRED>
<!ELEMENT     lim        - -          ( op, ll?, ul? )>
<!ELEMENT     op         o o          ( %data; )>
<!ELEMENT     ll         - o          ( %data; )>
<!ELEMENT     ul         - o          ( %data; )>
<!ELEMENT     fen        - -          ( %data;, ( cp, %data; )+ )>
<!ELEMENT     cp         - o          EMPTY>
<!ATTLIST     cp
  type      %vline;      #REQUIRED
  style     %style;      s>
<!ELEMENT     box        - -          ( %data; )>
<!ATTLIST     box
  style     %style;      s>
<!ELEMENT     fr         - -          ( nu, de )>
<!ATTLIST     fr
  shape    %shape;      built
  align    %fr-align;   c
  style    %style;      s>
<!ELEMENT     nu         o o          ( %data; )>
<!ELEMENT     de         - o          ( %data; )>
<!ELEMENT     rad        - -          ( rcd, rdx? )>
<!ELEMENT     rcd        o o          ( %data; )>
<!ELEMENT     rdx        - o          ( %data; )>
<!ELEMENT     ar         - -          ( r+ )>
<!ELEMENT     r          - o          ( c+ )>
<!ELEMENT     c          - o          ( top-border?, left-border?, bottom-border?,
  right-border?, %data; ) +( vmk )>
<!ATTLIST     c
  cspan     NUMBER      1
  rspan     NUMBER      1
  ca        %halign;    l
  ra        %valign;    t>
<!ELEMENT     top-border - o          EMPTY>
<!ATTLIST     top-border
  type      %hline;      bar
  style     %style;      s>
<!ELEMENT     left-border - o          EMPTY>
<!ATTLIST     left-border
  type      %vline;      vb
  style     %style;      s>
<!ELEMENT     bottom-border - o          EMPTY>
<!ATTLIST     bottom-border
  type      %hline;      bar
  style     %style;      s>
<!ELEMENT     right-border - o          EMPTY>

```

```

<!ATTLIST      right-border
                type          %vline;      vb
                style        %style;       s>
<!ELEMENT      vmk            - o         EMPTY>
<!ELEMENT      arrow         - -         ( %data; )>
<!ELEMENT      hsp           - o         EMPTY>
<!ATTLIST      hsp
                sp            NUTOKEN      "1.0">
<!ELEMENT      vsp           - o         EMPTY>
<!ATTLIST      vsp
                sp            NUTOKEN      "1.0">

<!-- font change -->

<!ELEMENT      b              - -         ( %data; )>
<!ELEMENT      it             - -         ( %data; )>
<!ELEMENT      of             - -         ( %data; )>
<!ELEMENT      sc             - -         ( %data; )>
<!ELEMENT      ge             - -         ( %data; )>
<!ELEMENT      ssf            - -         ( %data; )>
<!ELEMENT      ty             - -         ( %data; )>
<!ELEMENT      scp            - -         ( %data; )>
<!ELEMENT      rm             - -         ( %data; )>

<!-- character set -->

<!ENTITY % es-chars PUBLIC "-//ES/ENTITIES special characters version 4.0.0//EN">
%es-chars;

```

Appendix F

Document type definition for glossaries

```
<!-- Elsevier Science Glossary DTD version 1.0.0

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provided this notice is included in all copies, but changing it is not allowed.

Typical invocation:
<!DOCTYPE glossary PUBLIC "-//ES/DTD glossary DTD version 1.0.0//EN" []>
-->

<!-- notations -->

<!NOTATION IMAGE PUBLIC "-//ES/NOTATION image format//EN">

<!-- data entities -->

<!ENTITY % font-change "(b|it|rm|of|sc|ge|ssf|ty|scp)" >
<!ENTITY % inline "(f|sup|inf|a|ovl|ov|ovr|unl|un|unr|lim|fen|box|fr|rad|ar|
arrow|hsp|vsp|inline-fig)" >
<!ENTITY % data "(#PCDATA|font-change;|inline;|cross-ref)*" >

<!ENTITY % accent-pos "(u|m|d)" >
<!ENTITY % arrange "(staggered)" >
<!ENTITY % fr-align "(l|r)" >
<!ENTITY % halign "(l|c|r|j|d|vmk)" >
<!ENTITY % hline "(bar|tcub|bcub|tsqb|bsqb|circ|tilde|larr|rarr|harr|lharu|rharu)" >
<!ENTITY % language "(de|en|es|fr|pt|ru)" >
<!ENTITY % loc "(pre|post)" >
<!ENTITY % shape "(built|case|sol)" >
<!ENTITY % style "(s|d|t|da|dot|b|bl|n)" >
<!ENTITY % valign "(t|m|b|vj)" >
<!ENTITY % vline "(lpar|rpar|lsqb|rsqb|lcub|rcub|lang|rang|vb|sol|bsol|lceil|rceil|lfloor|rfloor)" >

<!-- glossary -->

<!ELEMENT glossary - o ( st?, glossary-entry+ )>
<!ATTLIST glossary
version NUTOKEN #FIXED "1.0.0"
docid CDATA #REQUIRED
language %language; en>

<!-- section title, without ID attribute -->

<!ELEMENT st - o ( %data; )>

<!-- glossary entry -->

<!ELEMENT glossary-entry - o ( glossary-heading, glossary-def*, cross-ref*,
glossary-entry* )>
<!ATTLIST glossary-entry
id ID #IMPLIED>

<!-- glossary heading -->

<!ELEMENT glossary-heading - o ( %data;, glossary-heading* )>
```

```

<!-- glossary definition -->

<!ELEMENT      glossary-def      - o          ( %data; )>

<!-- reference to object in document, i.e. glossary entry -->

<!ELEMENT      cross-ref         - -          ( %data; )>
<!ATTLIST     cross-ref
              refid              IDREFS      #REQUIRED>

<!-- inline figure -->

<!ELEMENT      inline-fig        - -          ( link )>

<!-- reference to local external entity, i.e. inter-document or local file -->

<!ELEMENT      link              - o          EMPTY>
<!ATTLIST     link
              locator            ENTITY      #REQUIRED>

<!-- inline formula, no exclusion of FD -->

<!ELEMENT      f                 - -          ( %data; )>

<!-- built-up text, with model of <c> added -->

<!ELEMENT      sup               - -          ( %data; )>
<!ATTLIST     sup
              loc                 %loc;      #IMPLIED
              arrange            %arrange;   #IMPLIED>
<!ELEMENT      inf               - -          ( %data; )>
<!ATTLIST     inf
              loc                 %loc;      #IMPLIED
              arrange            %arrange;   #IMPLIED>
<!ELEMENT      a                 - -          ( ac, ac )>
<!ATTLIST     a
              valign            %accent-pos; u>
<!ELEMENT      ac                o o          ( %data; )>
<!ELEMENT      ovl               - -          ( %data; )>
<!ATTLIST     ovl
              type              %hline;     #REQUIRED
              style            %style;     s>
<!ELEMENT      ov                - o          EMPTY>
<!ATTLIST     ov
              id                ID          #REQUIRED
              type              %hline;     #REQUIRED
              style            %style;     s>
<!ELEMENT      ovr               - o          EMPTY>
<!ATTLIST     ovr
              refid            IDREF       #REQUIRED>
<!ELEMENT      unl               - -          ( %data; )>
<!ATTLIST     unl
              type              %hline;     #REQUIRED
              style            %style;     s>
<!ELEMENT      un                - o          EMPTY>
<!ATTLIST     un
              id                ID          #REQUIRED
              type              %hline;     #REQUIRED
              style            %style;     s>
<!ELEMENT      unr               - o          EMPTY>
<!ATTLIST     unr
              refid            IDREF       #REQUIRED>
<!ELEMENT      lim               - -          ( op, ll?, ul? )>
<!ELEMENT      op                o o          ( %data; )>
<!ELEMENT      ll                - o          ( %data; )>
<!ELEMENT      ul                - o          ( %data; )>
<!ELEMENT      fen               - -          ( %data;, ( cp, %data; )+ )>
<!ELEMENT      cp                - o          EMPTY>
<!ATTLIST     cp
              type              %vline;     #REQUIRED
              style            %style;     s>

```

```

<!ELEMENT      box          - -          ( %data; )>
<!ATTLIST     box
  style        %style;          s>
<!ELEMENT     fr            - -          ( nu, de )>
<!ATTLIST     fr
  shape        %shape;          built
  align        %fr-align;       c
  style        %style;          s>
<!ELEMENT     nu            o o          ( %data; )>
<!ELEMENT     de            - o          ( %data; )>
<!ELEMENT     rad           - -          ( rcd, rdx? )>
<!ELEMENT     rcd           o o          ( %data; )>
<!ELEMENT     rdx           - o          ( %data; )>
<!ELEMENT     ar            - -          ( r+ )>
<!ELEMENT     r             - o          ( c+ )>
<!ELEMENT     c             - o          ( top-border?, left-border?, bottom-border?,
  right-border?, %data; ) +( vmk )>
<!ATTLIST     c
  cspan        NUMBER           1
  rspan        NUMBER           1
  ca           %halign;         l
  ra           %valign;         t>
<!ELEMENT     top-border    - o          EMPTY>
<!ATTLIST     top-border
  type        %hline;          bar
  style        %style;          s>
<!ELEMENT     left-border   - o          EMPTY>
<!ATTLIST     left-border
  type        %vline;          vb
  style        %style;          s>
<!ELEMENT     bottom-border - o          EMPTY>
<!ATTLIST     bottom-border
  type        %hline;          bar
  style        %style;          s>
<!ELEMENT     right-border  - o          EMPTY>
<!ATTLIST     right-border
  type        %vline;          vb
  style        %style;          s>
<!ELEMENT     vmk           - o          EMPTY>
<!ELEMENT     arrow         - -          ( %data; )>
<!ELEMENT     hsp           - o          EMPTY>
<!ATTLIST     hsp
  sp          NUTOKEN           "1.0">
<!ELEMENT     vsp           - o          EMPTY>
<!ATTLIST     vsp
  sp          NUTOKEN           "1.0">

<!-- font change -->

<!ELEMENT     b             - -          ( %data; )>
<!ELEMENT     it            - -          ( %data; )>
<!ELEMENT     of            - -          ( %data; )>
<!ELEMENT     sc            - -          ( %data; )>
<!ELEMENT     ge            - -          ( %data; )>
<!ELEMENT     ssf           - -          ( %data; )>
<!ELEMENT     ty            - -          ( %data; )>
<!ELEMENT     scp           - -          ( %data; )>
<!ELEMENT     rm            - -          ( %data; )>

<!-- character set -->

<!ENTITY % es-chars PUBLIC "-//ES/ENTITIES special characters version 4.0.0//EN">
%es-chars;

```

Appendix G

Changes with respect to previous version

The following changes were made to the document type definitions:

1. removed `orf`, `secr`, `appr`, `fnr`, `bibr`, `lir`, `tblr`, `figr` and `fdr` (CR 62, 85, 97)
2. added `xref` element to `&data;` to replace them (CR 62, 85, 97)
3. changed the attribute type of `id` in `sec`, `app`, `fn`, `bib`, `li`, `tbl`, `tblfn`, `fig`, `fd`, `ov` and `un` from `cdata` to `id` (CR 62, 85, 97)
4. added a `no` element to `sec`, `app`, `fn`, `bib`, `tbl`, `tblfn`, `fig` and `fd` (CR 62, 85, 97)
5. changed `orf` to `xref` in `aug` (CR 62, 85, 97)
6. removed `oid` (CR 62, 85, 97)
7. added an `id` attribute to `aff` (CR 62, 85, 97)
8. added a `plate` and `scheme` element to `&data;` (CR 62, 85, 97)
9. removed the `type` attribute of `fig` (CR 62, 85, 97)
10. renamed `figlnk` to `link`: also used in `non-fig` (CR 62, 85, 97)
11. removed the `legend` element (CR 35)
12. `bibl` becomes optional and repeatable in `bm` (CR 112)
13. `bibl` gets an optional `st` element (CR 112)
14. removed the `mag` attribute from `figbdy` and `figlnk` (CR 86)
15. added optional `sec` to the content model of `abs` (CR 115)
16. added the value `M` to the attribute type of `valign` in `A` (CR 74)
17. removed the included `vmk` from `fd` (CR 100)
18. added `vmk` as in inclusion to `c` (CR 100)
19. added `ead` element (CR 13)
20. added `ead` to the model of `aug` (`idem`)
21. changed the model of `au` to `(fnm? & snm, jr?)` (CR 83, comm)
22. added `degs` element (CR 50)
23. added `roles` element (CR 50)
24. added optional `degs` and `roles` elements to `au` (CR 50)
25. added `enun` element to `&data;` (CR 59)
26. changed the model of `qd` to `p+` (CR 51)
27. added element `caff` (CR 80)
28. added element `caff` to `collab` (CR 80)
29. added `link` to `tbl` (CR 92)
30. changed attribute value `ams` of `class` in `kwdg` to `msc` (CR 87)
31. added attribute value `psychinfo` to `class` in `kwdg` (CR 93)
32. changed attribute type of `class` in `kwdg` to `name list` (CR 85)
33. added attribute value `display` to `loc` in `tbl`, `fig`, `scheme` and `plate` (CR 39)
34. added attribute values `es`, `pt` and `ru` to all language attributes (CR 47)
35. changed attribute type of language attributes to `name list` (CR 85)
36. changed model of `authors` to `(collab | (author+, et-al?))+`
37. added attribute value `teaser` to `class` in `abs` (CR 32)
38. added `glossary` and sub-elements (CR 55)
39. added `glossary` to `bm` (CR 55)
40. added `textbox` (CR 111)
41. added `textbox` to `&data;` (CR 111)
42. removed `figbdy` (not in use)
43. changed `e-path` to `e-host` (CR 78, 82)
44. changed attribute name of (now) `e-host` to `locator` (CR 78, 82)
45. added `locator-type` and `object-type` attributes to `e-host` (CR 78, 82)

46. added `inter-ref` (CR 15, 78, 82)
47. added `inter-ref` to `&data;` (CR 78, 82)
48. added `inter-ref` to `e-host` (comm)
49. added `intra-ref` (CR 55)
50. added `intra-ref` to `&data;` (CR 55)
51. added object type to `intra-ref` (comm)
52. attribute value def removed from `type` in `l` (CR 49)
53. added `dl` and sub-element (CR 49)
54. added `dl` to `&data;` (CR 49)
55. excluded `fd` from `f` (comment)
56. added `further-reading` (CR 17)
57. changed the model of `fen` to require one or more `cp` (comment)
58. changed attribute type of `style` in `cp` from `cdata` to name list (CR 52, 85)
59. changed attribute type of `style` in `ovl`, `ov`, `unl`, `un`, `box` and `fr` (CR 85)
60. added `type` attribute to `ovl`, `ov`, `unl`, `un` and `cp` (CR 52)
61. changed attribute type of `docsubty` to name list (CR 85)
62. added attribute values `cor`, `dis`, `edi`, `sco`, `err`, `add` and `abs` to `docsubty` (CR 62, 97, ...)
63. removed `crt` and `crtyr` attributes from `art` (CR 85)
64. added `copyright` element (CR 85)
65. added `copyright` element to `art` (CR 85)
66. added required `yr` attribute to `copyright` (CR 123)
67. added required `type` attribute to `copyright` (CR 123)
68. removed `dohead` and `doctopic` attributes from `art` (CR 85)
69. added `dohead` and `doctopic` elements (CR 85)
70. added `dohead` and `doctopic` elements to `art` (CR 85)
71. changed the attribute type of `version` in `art` to `nutoken` (CR 85)
72. changed the attribute value of `version` in `art` to 4.0.0
73. changed the attribute type of `pii` in `art` to `nmtoken` (CR 85)
74. remove index attributes from `snm` (CR 85)
75. added index element (CR 85)
76. added index element to `snm` (CR 85)
77. added index element to `collab` (CR 27)
78. remove `inits` attributes from `fnm` (CR 85)
79. added `inits` element (CR 85)
80. added `inits` element to `fnm` (CR 85)
81. changed attribute model of `crs` in `c` to `names` (CR 85)
82. added `crtype` attribute to `c` (CR 58)
83. changed `atl+` to `atl*` in `fm` (CR 50)
84. changed `aug+` to `aug8` in `fm` (CR 50)
85. added `salutation` (CR 50)
86. added optional `salutation` to `bdy` (CR 50)
87. added `refers-to` attribute to `art` (CR 50)
88. added notation image (CR 62, 70, 85, 97)
89. added `upi` element (CR 82)
90. added `upi` to `&data;` (CR 82)
91. added notation application (CR 82)
92. added notation audio (CR 82)
93. added notation video (CR 82)
94. added notation text (CR 55, 82)
95. added list of `locator-type` values (CR 82)
96. added list of `object-type` values (CR 82)
97. changed most remaining attribute types of `type` name or `cdata` to name list (CR 85)
98. added implied `cny-code` attribute to `cny` (comm)
99. added an implied `id` to the `vt` (comm)
100. added an implied `picture` to the `vt` (comm)
101. changed the `id` of `fn` to `#required` (comm)
102. changed the `id` of `tblfn` to `#required` (comm)
103. attribute `sp` of `hsp` now has a default value (comm)
104. attribute `sp` of `vsp` now has a default value (comm)
105. updated the `litlen`, `grpcnt`, `grpgcnt` and `attcnt` in the `sgml` declaration
106. added an optional `no` element to `li` (comm)
107. changed `volume-nr+` to `volume-nr?` in `series` (comm)

108. changed `issue-nr*` to `issue-nr?` in `issue` (comm)
109. added the value `neurosci` to the `class` attribute of `kwdg` (CR 120)
110. changed minimization of `kwd` from `- o to - -` (comm)
111. changed minimization of `sec` from `- o to - -` (comm)
112. changed minimization of `qd` from `- o to - -` (comm)
113. added `atlfm` element (CR 122)
114. added optional `atlfm` elements to `fm` (CR 122)
115. added many new values to `docsubty` in `art` (TeCo)
116. removed value `inline` from the `loc` attribute of `fig`, `tbl`, etc (TeCo)
117. added element `inline-fig` (TeCo)
118. added element `inline-fig` to `&data;` (TeCo)
119. changed vertical align values to `(t|m|b|vj)` (TeCo)
120. changed minimization of `R` from `o o to - o` (TeCo)
121. changed minimization of `c` from `o o to - o` (TeCo)
122. added `top-border`, `left-border`, `bottom-border` and `right-border` elements (TeCo)
123. added default values to the attributes of `top-border`, `left-border`, `bottom-border` and `right-border` (comm)
124. removed `crs` attribute from `c`, added `top-border` etc elements to `c` (TeCo)
125. removed `crspan` attribute from `c`, added `cspan` and `rspan` attributes (TeCo)
126. removed `cra` attribute from `c`, added `ca` and `ra` attributes (TeCo)
127. added default values to the attributes of `c` (comm)
128. removed `crstubs` attribute from `tblbdy`, added `top-stubs` etc (TeCo)
129. added default values to the attributes of `tblbdy` (comm)
130. added default value `fla` to the attribute `docsubty` of `art` (comm)
131. added default value `en` to the attribute `language` of `art` (comm)
132. added default value `kwd` to the attribute `class` of `kwdg` (comm)
133. added nomenclature element (CR 124)
134. added optional nomenclature element to `fm` (CR 124)
135. added optional `id` attribute to `d1` (CR 124, comm)
136. added optional `no` and `st` to `d1` (CR 124)
137. added optional `id` attribute to `l` (CR 124, comm)
138. added optional `no` and `st` to `l` (CR 124)
139. changed the order of `conference`, `titles` and `editors` in `issue` (CR 79)
140. changed the order of `conference`, `editors` and `titles` in `edited-book` (CR 79)

The following changes were made to the set of character entities:

1. removed `Đ`, now coded as accented element
2. added `Ð`
3. removed `Ł`, now coded as accented element
4. added `Þ`
5. removed `đ`, now coded as accented element
6. removed `ł`, now coded as accented element
7. added `&z.aacute;`
8. added `&z.atr;`
9. added `&z.bar;`
10. removed `&z.bdj;`, now coded as accented element
11. added `&z.btyogh;`
12. added `&z.ctl;`
13. removed `&z.ctlc;`, now coded as accented element
14. removed `&z.ctlesh;`, now coded as accented element
15. removed `&z.ctlz;`, now coded as accented element
16. removed `&z.ctyogh;`, now coded as accented element
17. changed `&z.eth;` to `ð`
18. added `&z.fals;`
19. added `&z.ggrave;`
20. added `&z.gull;`
21. added `&z.hbar;`
22. added `&z.heng;`
23. added `&z.highs;`
24. added `&z.hris;`
25. added `&z.hriss;`
26. added `&z.hrtrrh;`
27. added `&z.ht;`

28. removed `&z.htb;`, now coded as accented element
29. removed `&z.htd;`, now coded as accented element
30. removed `&z.htg;`, now coded as accented element
31. removed `&z.hth;`, now coded as accented element
32. removed `&z.htheng;`, now coded as accented element
33. added `&z.hvlig;`
34. added `&z.lam;`
35. removed `&z.lhnl;`, now coded as accented element
36. removed `&z.lht;`, now coded as accented element
37. added `&z.lows;`
38. added `&z.lris;`
39. added `&z.lriss;`
40. added `&z.ltln;`
41. added `&z.mdc;`
42. added `&z.mids;`
43. added `&z.nlr;`
44. added `&z.pa;`
45. removed `&z.pbari;`, now coded as accented element
46. removed `&z.pbarl;`, now coded as accented element
47. removed `&z.pbaro;`, now coded as accented element
48. removed `&z.pbaru;`, now coded as accented element
49. added `&z.pg;`
50. added `&z.psmcu;`
51. added `&z.refhr;`
52. added `&z.refhrl;`
53. added `&z.reshtl;`
54. added `&z.resmck;`
55. removed `&z.rhreprs;`, now coded as accented element
56. removed `&z.rhschw;`, now coded as accented element
57. added `&z.risfla;`
58. added `&z.risfls;`
59. added `&z.riss;`
60. added `&z.rtr;`
61. added `&z.rtrfhr;`
62. added `&z.sbrgt;`
63. added `&z.sbs;`
64. added `&z.sbw;`
65. added `&z.sqh;`
66. added `&z.sqne;`
67. added `&z.sqsw;`
68. added `&z.sqv;`
69. changed `&z.thorn;` to `þ`
70. added `&z.trgull;`
71. added `&z.trnk;`
72. added `&z.trnomeg;`
73. removed `&z.xh;`, now coded as accented element
74. added `&z.xhighs;`
75. added `&z.xl;`
76. added `&z.xlows;`

Appendix H

Character set

The character set is defined by entity references whose definitions can be found at the end of the file that contains the document type definition for the present version of the DTD. A typical definition looks like this:

```
<!ENTITY cup SDATA "&cup;">
```

For every entity ('symbol') in this list, an appropriate identification of the equivalent in the presentation system must be found.

Entity name	Meaning	Sample output
†	dagger symbol	†
Æ	A-E ligature	Æ
⊕	plus sign in circle	⊕
ω	Greek letter omega	ω

Two entities require some explanation.

- ` `; This entity does not correspond to a printable character. It functions as a non-breaking space, i.e. an inter-word space that cannot be used as a line-breaking point during hyphenation and justification (H&J).
- ` ` This entity is used for punctuation space, or thousand-separator, in large numbers. It can be represented, for instance, by a thin space or a comma, depending on the style.

The complete set of symbols used in all publications of Elsevier Science – is given in the *Handbook Procedures and Standards*, chapter 45.01.01. On the following three pages we reproduce the tables that contain this set of symbols; these tables, B, C and P, are often called the 'Elsevier Science Grid'. As of this release the entity references for this character set are incorporated in one document that is referenced from the DTDs.

It is assumed that the characters RE, RS and TAB are never used in document instances, even though they are allowed by the SGML declaration, see appendix C. Multiple spaces count as one. All characters of the ASCII character set, can be used 'as is' in document instances, with the exception of the characters given below.

"	quotation mark, double quote	"
&	ampersand	&
<	less-than sign	<

Following the Grid we include three tables that serve as indexes to the Grid. These tables give the Grid coordinates of the symbol, the name of the entity reference corresponding to the symbol, and a short description. The first index is sorted alphabetically on the entity names; the second one is sorted on the Grid coordinates. The Grid coordinates are used in the following way: the coordinates are given as a sequence of three letters, for example 'Bcd'. The entity with these coordinates can be found in table B, column c, row d.

Some of the cells in the grid do not contain an entity name, but an accent construction. We decompose certain glyphs in a letter and an accent for structural reasons (for information about this practice in the area of phonetics please refer to [5]). This does not mean that during presentation it always has to be *created* as such. It is well possible that for some letter-accent combinations there is a mapping to a position in a (virtual) font. This resembles the situation with ligatures,

e.g. the well-known ‘fi’ ligature. Structurally, we distinguish the letters ‘f’ and ‘i’ as being separate, but together they sometimes (depending on the font, and perhaps the position in the word) combine to a special glyph.

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u		
a	⇌	↷	↓	<	>	‡	‡	&	∇	∑	<	≠	>	≠	∈	∉	⇒	⇏	×	+		a	
b	⇌	↷	↓	⟨	⟩			¢	∑	∏	≤	≠	≥	≠					x	+		b	
c	↷	↶	↓	[]	§		\$	∇	∏	≤		≥		∩	∩	∩	∩	·	±	€	c	
d	↷	↶	↓	[]	¶		£	∩	∏	≤	≠	≥	≠	∩	∩	∩	∩	×	+		d	
e	↷	↶	↑			⊗		f		√	≤	≠	≥	≠		∩		≠	×	+		e	
f	←	←	↑			↘	◇	¥	∩	∩	≤	≠	≥	≠		∩		≠	×	*		f	
g	←	←	↑			◇	◊	₤	∩	∩	≤	≠	≥	≠	∩	∩	∩	∩	<		ħ	g	
h	←	←	↑			◇	◊		∩	∩	≤	≠	≥	≠	∩	∩	∩	∩	>		h	h	
i	↷		↶		+	♥	♦		∩	∩	≤	≠	≥	≠	∩	∩	∩	∩	∩			i	
j	↷	→	↶		#	♠		ø	∩	∩	≤	≠	≥	≠	∩		∩					j	
k	↷	♀	↶		:	♣			∩	∩	≤	≠	≥	≠	∩	∩	∩	∩	⊕		ℓ	k	
l	→	*	↶		:	☆			∩	∩	≤		≥		∩	∩	∩	∩	⊖	-		l	
m	→	↶	↷		:	★		%	∩	∩	≤		≥		∩	∩	∩	∩	⊖	-		m	
n	→	↶	↷		-	□	○	‰	∩	∩	≤	∩	≥			∩	∩	∩	⊖	-		n	
o	→			-	-	■	●		∩	∩	≤	∩	≥		∩		∩	∩	⊖	÷		o	
p	→	↶	↷	⊥		■	▨		∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		p	
q	←	↶	↷	⊥		■	▨		∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	-		q	
r	↷	↶	↷	⊥		■	▨	©	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	-		r	
s	↷	↶	↷	⊥	≠	■	▨	®	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	⊗	∩	s	
t	↷		↷	⊥		■	◐	™	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	t	
u	↷		↷	⊥	≠	■	◐		∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	u	
v	←			⊥	≠	■	◐		∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	v	
w	→	←	→	⊥		■	◐	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	Å	w
x	→		↶	⊥	≠	□	#	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	x	
y	←		↶	⊥	≠	□	#	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	y	
z	→		↶			□		∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩	∩	z	
1	→	↶	↷			△	△		∩	∩	≤	∩	≥		∩		∩	∩	⊖	∩		1	
2	↷	↶	↷			▽	▽		∩	∩	≤	∩	≥		∩		∩	∩	⊖	∩		2	
3	↷	↶		┌	┌	▽		∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		3	
4		↶		┌	┌	▽		∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		4	
5		↶		┌	┌	▲		∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		5	
6				-	+	▼	▨	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		6	
7				=	#	▶	▨	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		7	
8						▲	✂	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		8	
9							⊗	∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		9	
0								∩	∩	∩	≤	∩	≥		∩	∩	∩	∩	⊖	∩		0	
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u		

Figure H.1: Grid table B: symbols

	A	B	C	D	E	F	G	H	I	J	
a	´	a	А	α	Λ	æ		⌘			a
b	`	б	Б	β	В	Æ		⌚		<i>B</i>	b
c	”	ц	Ц	χ	Х	ċ		⌞			c
d	^	д	Д	δ	Δ	Ð		λ			d
e	¨	е	Е	ε	Ε	œ	i				e
f		ф	Ф	φ	Φ	Œ					f
g	°	г	Г	γ	Γ						g
h	¸	х	Х	η	Н	ı				<i>H</i>	h
i	˘	и	И	ι	І	Ј					i
j	ˇ	я	Я	ϑ	Θ						j
k	ˇ	к	К	κ	К						k
l	¸	л	Л	λ	Λ	ł				<i>L</i>	l
m	ˉ	м	М	μ	Μ	Ł				<i>M</i>	m
n	•	н	Н	ν	Ν						n
o	•	о	О	ο	Ο	ø				<i>O</i>	o
p	…	п	П	π	Π	Ø					p
q	…	ч	Ч	θ	Θ		ı				q
r		р	Р	ρ	Ρ						r
s		с	С	σ	Σ	ß					s
t		т	Т	τ	Τ						t
u		у	У	υ	Υ	ª					u
v		в	В	ς		º					v
w		щ	Щ	ω	Ω						w
x	¸	ш	Ш	ξ	Ξ						x
y	/	ы	Ы	ψ	Ψ						y
z	/	з	З	ζ	Ζ						z
1		э	Э		∇						1
2		і	І	ϖ	Ϝ						2
3		й	Й	ε							3
4		ь	Ь	φ							4
5		ю	Ю	Ϝ							5
6		ъ	Ъ	ð							6
7		ж	Ж	ϐ	<	>					7
8				κ	«	»					8
9				ϙ	‘	’					9
0				ι	“	”					0
	A	B	C	D	E	F	G	H	I	J	

Figure H.2: Grid table C: alphabets and accents

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t		
a	á	â	ã	ä	å	À	Á	Â													a	
b	á	â	ã	ä	å	À	Á	Â														b
c	á	â	ã	ä	å	À	Á	Â														c
d	á	â	ã	ä	å	À	Á	Â														d
e	á	â	ã	ä	å	À	Á	Â														e
f	á	â	ã	ä	å	À	Á	Â														f
g	á	â	ã	ä	å	À	Á	Â														g
h	á	â	ã	ä	å	À	Á	Â														h
i	á	â	ã	ä	å	À	Á	Â														i
j	á	â	ã	ä	å	À	Á	Â														j
k	á	â	ã	ä	å	À	Á	Â														k
l	á	â	ã	ä	å	À	Á	Â														l
m	á	â	ã	ä	å	À	Á	Â														m
n	á	â	ã	ä	å	À	Á	Â														n
o	á	â	ã	ä	å	À	Á	Â														o
p	á	â	ã	ä	å	À	Á	Â														p
q	á	â	ã	ä	å	À	Á	Â														q
r	á	â	ã	ä	å	À	Á	Â														r
s	á	â	ã	ä	å	À	Á	Â														s
t	á	â	ã	ä	å	À	Á	Â														t
u	á	â	ã	ä	å	À	Á	Â														u
v	á	â	ã	ä	å	À	Á	Â														v
w	á	â	ã	ä	å	À	Á	Â														w
x	á	â	ã	ä	å	À	Á	Â														x
y	á	â	ã	ä	å	À	Á	Â														y
z	á	â	ã	ä	å	À	Á	Â														z
0	á	â	ã	ä	å	À	Á	Â														0
1	á	â	ã	ä	å	À	Á	Â														1
2	á	â	ã	ä	å	À	Á	Â														2
3	á	â	ã	ä	å	À	Á	Â														3
4	á	â	ã	ä	å	À	Á	Â														4
5	á	â	ã	ä	å	À	Á	Â														5
6	á	â	ã	ä	å	À	Á	Â														6
7	á	â	ã	ä	å	À	Á	Â														7
8	á	â	ã	ä	å	À	Á	Â														8
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t		

Figure H.3: Grid table P: phonetic alphabet and accents

Entity name	Description	Coordinate
<code>&acoint;</code>	contour integral, anti-clockwise	Bj1
<code>&acute;</code>	acute (accent)	CAa
<code>&AElig;</code>	ligature AE	CFb
<code>&aelig;</code>	ash (phonetic symbol)	Pea
<code>&aleph;</code>	Aleph (Hebrew)	CHa
<code>&alpha;</code>	alpha – Greek –	CDa
<code>&amalg;</code>	inverted prod. (conjunction); amalgamation, coprod	Bjd
<code>&amp;</code>	ampersand	Bha
<code>&and;</code>	logical and; small infinum; wedge	Bin
<code>&And;</code>	double infinum (conjunction); double logical and	Bir
<code>&ang;</code>	angle	Bk1
<code>&ang90;</code>	right (90 degree) angle; factorial sign	Bk5
<code>&angmsd;</code>	angle-measured	Bk2
<code>&angsph;</code>	spherical angle	Bk3
<code>&ap;</code>	approximate; asymptotic	Bq4
<code>&ape;</code>	approximate, equals; asymptotic or equal to	Bq5
<code>&apid;</code>	triple tilde; approximately identical to	Bq6
<code>&ast;</code>	mid asterisk	Bk8
<code>&asymp;</code>	cupcap; asymptotically equal to	Brs
<code>&barwed;</code>	logical and, bar above; projective	Bix
<code>&Barwed;</code>	double bar wedge B: log and, dbl bar	Biz
<code>&bcong;</code>	reverse congruent	Bq9
<code>&Bcy;</code>	Beh – Cyrillic –	CCb
<code>&bcy;</code>	beh – Cyrillic–	CBb
<code>&becaus;</code>	because	Brt
<code>&beta;</code>	beta (phonetic symbol)	Pdb
<code>&beth;</code>	Beth (Hebrew)	CHb
<code>&bowtie;</code>	bowtie	Bsf
<code>&bprime;</code>	backprime; reverse prime	Bl5
<code>&breve;</code>	breve (accent)	CAj
<code>&brvbar;</code>	broken vertical bar	Ben
<code>&bsim;</code>	reverse mainline tilde; reverse similar	Bq7
<code>&bsime;</code>	reverse similar, equals	Bq8
<code>&bull;</code>	filled circle; bullet	Bgo
<code>&bump;</code>	bumpy equals; geometrically equiv. to; appr. equal	Brr
<code>&bumpe;</code>	bumpy equals, equals; approximately equal to	Brp
<code>&Cap;</code>	double intersection; (Cap)	Bii
<code>&cap;</code>	prod. of intrsctn of cl./sets; vee; small intrsctn	Big
<code>&caron;</code>	Hacek (Czech.), caron, wedge (accent)	CAk
<code>&ccoint;</code>	contour integral, clockwise	Bj2
<code>&cedil;</code>	cedilla (accent)	CAI
<code>&cent;</code>	cent sign	Bhb
<code>&check;</code>	check mark; tick	Bff
<code>&chi;</code>	chi (phonetic symbol)	Pbx
<code>&cir;</code>	circle, open	Bgn
<code>&circ;</code>	circumflex, Caret (accent)	CAd
<code>&cire;</code>	circseq R: circle, equals	Bqn

Entity name	Description	Coordinate
<code>&clubs;</code>	clubsuit; club, filled	Bfk
<code>&Colon;</code>	four dots in square; as	Btt
<code>&colone;</code>	colon, equals; is defined as	Bqt
<code>&comp;</code>	stretched c (phonetic symbol)	Pec
<code>&compfn;</code>	centered circle; composite function; convolution	Bk9
<code>&cong;</code>	congruent with; similar to	Bq3
<code>&conint;</code>	contour integral; circuital integral	Bjv
<code>&coprod;</code>	inverted product (cumulator)	Bjc
<code>&copy;</code>	copyright sign (circled C)	Bhr
<code>&ctdot;</code>	triple dot, centered	Bn9
<code>&cuepr;</code>	curly equals (above), precedes	Bkv
<code>&cuesc;</code>	curly equals (above), succeeds	Bmv
<code>&cularr;</code>	left curved arrow; anti-clockwise arrow	Bcp
<code>&Cup;</code>	double union; (Cup)	Bih
<code>&cup;</code>	sum or union of classes or sets; logical sum	Bif
<code>&curarr;</code>	right curved arrow; clockwise arrow	Bcq
<code>&cuvee;</code>	curly logical or	Biv
<code>&cuwed;</code>	curly logical and	Biu
<code>&cwint;</code>	clockwise integral	Bj3
<code>&dagger;</code>	dagger	Bfa
<code>&Dagger;</code>	double dagger; diesis	Bga
<code>&daleth;</code>	Daleth (Hebrew)	CHc
<code>&darr;</code>	downward arrow; decreases	Bcc
<code>&dArr;</code>	down double arrow; implies	Bcd
<code>&darr2;</code>	two downward arrows	Bcu
<code>&dashv;</code>	dash, vertical; turnstile	Bdt
<code>&dblac;</code>	double acute (accent)	CAc
<code>&dcy;</code>	deh – Cyrillic–	CBd
<code>&Dcy;</code>	Deh – Cyrillic –	CCd
<code>&deg;</code>	degree sign	Bk7
<code>&delta;</code>	delta – Greek –	CDd
<code>&Delta;</code>	delta (capital); increment – Greek –	CEd
<code>&dharrl;</code>	down harpoon left	Bca
<code>&dharr;</code>	down harpoon right	Bcb
<code>&diam;</code>	diamond	Bfg
<code>&diams;</code>	lozenge, filled	Bgi
<code>&divide;</code>	division sign	Bto
<code>&divonx;</code>	divide on times B; division on times	Btf
<code>&dlcorn;</code>	down left corner	Bd3
<code>&dminus;</code>	minus with dot beneath; tight dotted minus	Btm
<code>&doplus;</code>	plus sign, dot below; tight dotted plus	Bta
<code>&dot;</code>	dot above (accent)	CAo
<code>&DotDot;</code>	quadruple dot (accent)	CAq
<code>&drcorn;</code>	down right corner	Be3
<code>&dttdot;</code>	triple dot, diagonal NW-SE	Bp9
<code>&dtri;</code>	down triangle open	Bf2
<code>&dtrif;</code>	down triangle, filled	Bf6

Entity name	Description	Coordinate
<code>&ecir;</code>	circle in equals sign	Bqs
<code>&ecolon;</code>	equals, colon; defines	Bqu
<code>&ecy;</code>	eh – Cyrillic –	CB1
<code>&Ecy;</code>	Eh – Cyrillic –	CC1
<code>&eDDot;</code>	equal, double dot above and under	Bqv
<code>&edot;</code>	equals, dot above; approaches the limit	Bqo
<code>&eDot;</code>	equals, even dots; approximately equal	Bqp
<code>&efDot;</code>	equals, falling dots; appr. equal to; image of	Bqz
<code>&egs;</code>	equal-or-greater, slanted	Bmc
<code>&ell;</code>	roman script-l	Buk
<code>&els;</code>	equal-or-less, slanted	Bkc
<code>&empty;</code>	slashed zero; empty set	Bu0
<code>&emptyv;</code>	solidus in circle; empty set; null set; diameter	Bs1
<code>&epsi;</code>	epsilon (Porson) – Greek –	CDe
<code>&epsiv;</code>	epsilon (phonetic symbol)	Pfe
<code>&equest;</code>	equal, questionmark	Bqm
<code>&equiv;</code>	equivalent; identical with; triple equals	Bqx
<code>&erDot;</code>	rising dots equal R: eq, rising dots	Bqy
<code>&esim;</code>	** equal, similar	Bkp
<code>&eta;</code>	eta – Greek –	CDh
<code>&eth;</code>	eth (phonetic symbol)	Ped
<code>&ETH;</code>	ETH (phonetic symbol)	Pfd
<code>&exist;</code>	reversed cap. E; there exists; at least one exists	Bib
<code>&Fcy;</code>	Ef – Cyrillic –	CCf
<code>&fcy;</code>	ef – Cyrillic–	CBf
<code>&female;</code>	Venus; female	Bh4
<code>&flat;</code>	flat (music)	Bhw
<code>&forall;</code>	inverted capital A; for all	Bia
<code>&fork;</code>	pitchfork	Bm3
<code>&frown;</code>	down curve, frown	Bm2
<code>&gamma;</code>	gamma – Greek –	CDg
<code>&Gamma;</code>	gamma (capital) – Greek –	CEg
<code>&gammad;</code>	digamma	CD5
<code>&gap;</code>	greater than, approximately	Bmg
<code>&Gcy;</code>	Geh – Cyrillic –	CCg
<code>&gcy;</code>	geh – Cyrillic–	CBg
<code>&gdot;</code>	greater dot R: greater than, with dot	Bmo
<code>&ge;</code>	greater than or equal to	Bmd
<code>&gE;</code>	greater than or double equal to	Bme
<code>&gEl;</code>	greater, (double) equal, or less	Bmk
<code>&geli;</code>	greater, equal, or less	Bmj
<code>&ges;</code>	greater than or equal to, slanted	Bmb
<code>&Gg;</code>	much greater than (triple)	Bmn
<code>&gimel;</code>	Gimel (Hebrew)	CHd
<code>&gl;</code>	greater than or less than	Bmi
<code>&gnap;</code>	greater than but not approximate	Bng
<code>&gne;</code>	greater than, not equals to	Bnd

Entity name	Description	Coordinate
<code>&gtne;</code>	greater than but not (double) equal to	Bne
<code>&gnsim;</code>	greater than but not similar to	Bnf
<code>&grave;</code>	grave (accent)	CAb
<code>&gsim;</code>	greater than or similar to; greater than approx.	Bmf
<code>&Gt;</code>	much greater than (double)	Bml
<code>&HARDcy;</code>	Tvyordyy znak – Cyrillic –	CC6
<code>&hardcy;</code>	tvjordyy znak – Cyrillic–	CB6
<code>&harr;</code>	left-right arrow; mutually implies	Bar
<code>&harrw;</code>	left and right arrow-wavy	Bai
<code>&hearts;</code>	heartsuit; heart, filled	Bfi
<code>&hellip;</code>	triple dot	Bm9
<code>&hercon;</code>	hermitian conjugative matrix	Bte
<code>&homthr;</code>	homothetic	Bq0
<code>&icy;</code>	ee – Cyrillic–	CBi
<code>&Icy;</code>	Ee – Cyrillic –	CCi
<code>&iexcl;</code>	inverted exclamation mark (Spanish)	CGe
<code>&iff;</code>	left-right dbl arrow; if and only if; mut. implies	Bas
<code>&iiota;</code>	inverted iota – Greek –	CD0
<code>&imof;</code>	image of	Bop
<code>&infin;</code>	infinity sign	Blz
<code>&inodot;</code>	i, undotted (phonetic symbol)	Pei
<code>&int;</code>	integral operator	Bjp
<code>&intcal;</code>	intercal; true	Bdq
<code>&iota;</code>	iota (phonetic symbol)	Pci
<code>&iprod;</code>	intprod	Bk6
<code>&iquest;</code>	inverted question mark (Spanish)	CGq
<code>&isin;</code>	set membership; member	Boa
<code>&Jcy;</code>	Ee kratkoyeh – Cyrillic –	CC3
<code>&jcy;</code>	ee kratkoyeh – Cyrillic–	CB3
<code>&jnodot;</code>	j, undotted (phonetic symbol)	Pfj
<code>&kappa;</code>	kappa – Greek –	CDk
<code>&kappav;</code>	kappa (cursive,rounded) – Greek –	CD8
<code>&kcy;</code>	kah – Cyrillic–	CBk
<code>&Kcy;</code>	Kah – Cyrillic –	CCK
<code>&khcy;</code>	tchek – Cyrillic–	CBq
<code>&KHcy;</code>	Tchek – Cyrillic –	CCq
<code>&lAarr;</code>	left triple arrow	Baq
<code>&Lambda;</code>	lambda (capital) – Greek –	CEl
<code>&lambda;</code>	lambda (phonetic symbol)	Pgl
<code>&lang;</code>	left angle bracket	Bda
<code>&lap;</code>	less than and double approximate	Bkg
<code>&laquo;</code>	open double guillemet; angle open quote	CE8
<code>&lArr;</code>	left double arrow; is implied by	Bah
<code>&Larr;</code>	two-head left arrow	Bav
<code>&larr;</code>	left arrow; relata of a relation	Bag
<code>&larr2;</code>	two left arrows	Bau
<code>&larrhk;</code>	left arrow-hooked	Bae

Entity name	Description	Coordinate
<code>&larrlp;</code>	looparrowleft A: l arrow-looped	Bbe
<code>&larrtl;</code>	left arrow-tailed	Bay
<code>&lceil;</code>	left ceiling; bottomless left bracket	Bd2
<code>&Lcy;</code>	El – Cyrillic –	CC1
<code>&lcyl;</code>	el – Cyrillic–	CBI
<code>&ldot;</code>	less dot R: less than, with dot	Bko
<code>&ldquo;</code>	double quotation mark, left	CE0
<code>&le;</code>	less than or equal	Bkd
<code>&LE;</code>	less than or (double) equal	Bke
<code>&leg;</code>	less, equal, or greater	Bkj
<code>&LEg;</code>	less, (double) equal, or greater	Bkk
<code>&les;</code>	less than or equal to, slanted	Bkb
<code>&lfisht;</code>	left fish tail	Bey
<code>&lfloor;</code>	left floor; topless left bracket	Bd1
<code>&lg;</code>	less than or greater than	Bki
<code>&lhard;</code>	leftharpoondown A: l harpoon-down	Bbf
<code>&lharu;</code>	left harpoon-up	Baf
<code>&Ll;</code>	much less than (triple)	Bkn
<code>&lnap;</code>	less than but not approximate	Blg
<code>&lnE;</code>	less than but not (double) equal to	Ble
<code>&lne;</code>	less than but not equals	Bld
<code>&lnsim;</code>	less than, not similar	Blf
<code>&loang;</code>	left open angular bracket	Bdd
<code>&lbrk;</code>	left open bracket	Bdc
<code>&loz;</code>	lozenge open; total mark	Bgf
<code>&lparlt;</code>	left parenthesis, less than	Bi7
<code>&lrarr2;</code>	left over right arrow; reversible reaction	Bac
<code>&lrhar2;</code>	left over right harpoon; reversible reaction	Baa
<code>&lsh;</code>	Lsh A: **left hook arrow up	Bbw
<code>&lsim;</code>	less than or similar to; less, approximate	Bkf
<code>&lsquo;</code>	turned comma (phonetic symbol)	PI2
<code>&lt;</code>	less than sign	Bka
<code>&Lt;</code>	much less than (double)	Bkl
<code>&lthree;</code>	left three times	Bsh
<code>&ltimes;</code>	times sign, left closed	Bsd
<code>&ltri;</code>	left elongated triangle; implied by	Bi1
<code>&ltrie;</code>	triangle left eq R: left triangle, equal	Btu
<code>&ltrif;</code>	left triangle, filled	Bf8
<code>&macr;</code>	overbar, macron (accent)	CAm
<code>&male;</code>	Mars; male	Bh7
<code>&malt;</code>	Maltese cross	Bfe
<code>&Map;</code>	two-head right arrow, ended	Bax
<code>&map;</code>	mapping; maps to	Bao
<code>&mcy;</code>	em – Cyrillic–	CBm
<code>&mdash;</code>	em dash , copymarked l/M	Btr
<code>&mDDot;</code>	geometric properties	Btp
<code>&mid;</code>	divides; mid (Height of capital I)	Bdi

Entity name	Description	Coordinate
<code>&middot;</code>	center dot	Bsc
<code>&minus;</code>	minus sign	Btl
<code>&minusb;</code>	minus sign in box	Bs6
<code>&minusd;</code>	minus with dot above; symmetric difference	Btn
<code>&mnplus;</code>	minus or plus sign	Btd
<code>&mu;</code>	mu – Greek –	CDm
<code>&mumap;</code>	multimap A:	Boo
<code>&nabla;</code>	differential vector; nabla;	CE1
<code>&nap;</code>	not approximate; not asymptotic to	Br4
<code>&napid;</code>	not approximately, double; dashed triple tilde	Br6
<code>&natur;</code>	natural (music)	Bhy
<code>&nbsp;</code>	no break (required) space	Ba0
<code>&ncong;</code>	not congruent with; neither appr. nor act. equal	Br3
<code>&ncy;</code>	en – Cyrillic–	CBn
<code>&ndash;</code>	en dash (long hyphen), copymarked 1/N	Btq
<code>&ne;</code>	double-barred slash (phonetic symbol)	Ph1
<code>&nearhk;</code>	N-E arrow, hooked	Bbd
<code>&nearr;</code>	arrow, north-east; grows	Bck
<code>&nequiv;</code>	not equivalent, not identical with	Brx
<code>&nesear;</code>	N-E, S-E arrows	Bb2
<code>&nexist;</code>	not rev. cap. E; not exists; there does not exist	Bic
<code>&ngE;</code>	ngeqq N: not greater, dbl equals	Bnk
<code>&nge;</code>	ngeq N: not greater-than-or-equal	Bnj
<code>&nges;</code>	neither greater than nor equal to, slanted	Bnb
<code>&ngt;</code>	not greater than	Bna
<code>&nhArr;</code>	not left-right dbl arrow; negation of mut. implies	Bbs
<code>&nharr;</code>	not left-right arrow	Bbr
<code>&ni;</code>	contains; owns; includes	Bqa
<code>&nlarr;</code>	not left arrow	Bbg
<code>&nlArr;</code>	not left double arrow; not implied by	Bbh
<code>&nle;</code>	nleq N: not less-than-or-equal	Blj
<code>&nle;</code>	nleq N: not less, dbl equals	Blk
<code>&nles;</code>	neither less than nor equal to, slanted	Blb
<code>&nlt;</code>	not less than	Bla
<code>&nltri;</code>	not left triangle	Bi4
<code>&nltrie;</code>	ntrianglelefteq N: not l tri, eq	Btw
<code>&nmid;</code>	not mid	Bei
<code>&not;</code>	logical not sign	Bro
<code>&notin;</code>	not an element of; is not a member of	Bpa
<code>&notni;</code>	does not contain as a member	Bra
<code>&npar;</code>	not parallel	Bej
<code>&npr;</code>	does not precede	Blq
<code>&npre;</code>	npreceq N: not precedes, equals	Blu
<code>&nrArr;</code>	not right double arrow; does not imply	Bbn
<code>&nrarr;</code>	not right arrow; does not tend to	Bbm
<code>&nrtri;</code>	not right triangle	Bi2
<code>&nrtrie;</code>	ntrianglerighteq N: not r tri, eq	Btx

Entity name	Description	Coordinate
<code>&nsc;</code>	does not succeed	Bnq
<code>&nsce;</code>	nsucceq N: not succeeds, equals	Bnu
<code>&nsim;</code>	not similar; not equivalent to	Br1
<code>&nsime;</code>	not similar, equals; not asymptotically equal to	Br2
<code>&nsup;</code>	not subset; non-proper inclusion in set	Bpc
<code>&nsupE;</code>	not subset, double equals	Bpi
<code>&nsupe;</code>	not subset, equals; not contained in or not eql to	Bpf
<code>&nsup;</code>	not superset; does not properly include in set	Brc
<code>&nsupE;</code>	not superset, double equals	Bri
<code>&nsupe;</code>	not superset, equals; does not contain as subset	Brf
<code>&nu;</code>	nu – Greek –	CDn
<code>&nvDash;</code>	not vertical, double-dash	Bex
<code>&nVdash;</code>	not double vertical, dash	Beu
<code>&nVDash;</code>	not double vertical, double dash	Bev
<code>&nvdash;</code>	not vertical, dash	Bes
<code>&nwarhk;</code>	N-W arrow, hooked	Bbc
<code>&nwarr;</code>	arrow, north-west	Bci
<code>&nwnear;</code>	N-W, N-E arrows	Bb5
<code>&oast;</code>	circled asterisk	Bs2
<code>&ocir;</code>	circled circ B: open dot in circle	Bsn
<code>&odash;</code>	circled dash B: hyphen in circle	Bsl
<code>&odot;</code>	bull's eye (phonetic symbol)	Pbo
<code>&OElig;</code>	small capital O-E ligature (phonetic symbol)	Pfo
<code>&oelig;</code>	o-e ligature (phonetic symbol)	Peo
<code>&ogon;</code>	polish hook, Ogonek (accent)	CAx
<code>&olarr;</code>	** circlearrowleft A: l arrow in circle	Bbp
<code>&omega;</code>	lower-case omega (phonetic symbol)	Pho
<code>&Omega;</code>	omega (capital) – Greek –	CEw
<code>&omicr;</code>	omicron – Greek –	CDo
<code>&ominus;</code>	minus sign in circle; symmetric difference	Bsp
<code>&oplus;</code>	plus sign in circle; direct sum; earth sign	Bsr
<code>&or;</code>	logical or; small supremum	Bim
<code>&Or;</code>	double supremum (conjunction); double logical or	Biq
<code>&orarr;</code>	** circlearrowright A: r arrow in circle	Bbq
<code>&origof;</code>	original of	Bpp
<code>&oslash;</code>	slashed o (phonetic symbol)	Pdo
<code>&Oslash;</code>	capital O, slashed	CFp
<code>&osol;</code>	o slash B: solidus in circle	Bsm
<code>&otimes;</code>	multiplication sign in circle; direct product	Bss
<code>&ovbar;</code>	circle, and vertical bar	Bsq
<code>&par;</code>	double Pipe (phonetic symbol)	Pi1
<code>&para;</code>	paragraph sign; pilcrow	Bfd
<code>&part;</code>	curly d; differential – Greek –	CD6
<code>&Pcy;</code>	Peh – Cyrillic –	CCp
<code>&pcy;</code>	peh – Cyrillic–	CBp
<code>&permil;</code>	per thousand; per mille	Bhm
<code>&perp;</code>	perpendicular; orthogonal to	Bdp

Entity name	Description	Coordinate
<code>&phi;</code>	phi – Greek –	CDf
<code>&Phi;</code>	phi (capital) – Greek –	CEf
<code>&phiv;</code>	phi (cursive,open) – Greek –	CD4
<code>&phone;</code>	telephone-symbol	Bg9
<code>&pi;</code>	pi – Greek –	CDp
<code>&Pi;</code>	pi (capital) – Greek –	CEp
<code>&piv;</code>	”physicians’ pi” – Greek –	CD2
<code>&plankv;</code>	Planck constant; h-bar (Dirac)	Buh
<code>&plusb;</code>	plus sign in box	Bs7
<code>&plusdo;</code>	plus sign, dot above; direct sum	Btb
<code>&plusmn;</code>	plus or minus sign	Btc
<code>&pound;</code>	pound sign	Bhd
<code>&pr;</code>	precedes; has lower rank than; is dominated by	Bkq
<code>&prap;</code>	precedes, approximate	Bks
<code>&prcue;</code>	curly prec. equal; has rank lower than or equal to	Bku
<code>&pre;</code>	preceq R: precedes, equals	Bkt
<code>&Prime;</code>	double prime; seconds; inches	Bm6
<code>&prime;</code>	prime; minutes; feet	Bm5
<code>&prnap;</code>	precedes, not approximately	Bls
<code>&prnE;</code>	precedes, not double equal	Blt
<code>&prnsim;</code>	precedes, not similar	Blr
<code>&prod;</code>	product operator	Bjb
<code>&prop;</code>	is proportional to; varies as	Bmz
<code>&prsim;</code>	precedes, similar; dominance; contained in, equiv.	Bkr
<code>&Psi;</code>	psi (capital) – Greek –	CEy
<code>&psi;</code>	psi – Greek –	CDy
<code>&puncsp;</code>	Punctuation space; thousand separator	Ba9
<code>&rAarr;</code>	right triple arrow	Bap
<code>&radic;</code>	root; radical sign	Bje
<code>&rang;</code>	right angle bracket	Bea
<code>&raquo;</code>	close double guillemet; angle close quote	CF8
<code>&rArr;</code>	right double arrow; implies	Ban
<code>&Rarr;</code>	two-head right arrow; on to map	Baw
<code>&rarr;</code>	right arrow; approaches	Bam
<code>&rarr2;</code>	two right arrows	Bat
<code>&rarrhk;</code>	right arrow-hooked	Bak
<code>&rarrlp;</code>	looparrowright A: r arrow-looped	Bbk
<code>&rarrtl;</code>	right arrow-tailed	Baz
<code>&rarrw;</code>	right arrow-wavy; functional relationship	Baj
<code>&rceil;</code>	right ceiling; bottomless right bracket	Be2
<code>&rdquo;</code>	double quotation mark, right	CF0
<code>&rect;</code>	rectangle open, horizontal	Bgx
<code>&reg;</code>	registered sign (circled R)	Bhs
<code>&rfisht;</code>	right fish tail; element precedes under relation;	Bdy
<code>&rfloor;</code>	right floor; topless right bracket	Be1
<code>&rhard;</code>	right harpoon-down A: rt harpoon-down	Bbj
<code>&rharu;</code>	right harpoon-up	Bal

Entity name	Description	Coordinate
<code>&rho;</code>	rho – Greek –	CDr
<code>&rhov;</code>	rho (cursive, round) – Greek –	CD9
<code>&ring;</code>	circle (accent)	CAg
<code>&rlarr2;</code>	right over left arrow; reversible reaction	Bad
<code>&rlhar2;</code>	right over left harpoon; reversible reaction	Bab
<code>&roang;</code>	right open angular bracket	Bed
<code>&robrk;</code>	right open bracket	Bec
<code>&rpargt;</code>	right parenthesis, greater	Bi0
<code>&rsh;</code>	Rsh A: **right hook arrow up	Bcw
<code>&rsquo;</code>	apostrophe (phonetic symbol)	Pj2
<code>&rthree;</code>	right three times	Bsg
<code>&rtimes;</code>	times sign, right closed	Bse
<code>&rtri;</code>	right triangle open	Bf3
<code>&rtrie;</code>	triangle right eq R: right tri, eq	Btv
<code>&rtrif;</code>	right triangle, filled	Bf7
<code>&sc;</code>	succeeds; has higher rank than; dominates	Bmq
<code>&scap;</code>	succeeds, approximate	Bms
<code>&sccue;</code>	succ. ,curly eq; has rank higher than or equal to	Bmu
<code>&sce;</code>	succesq R: succeeds, equals	Bmt
<code>&scnap;</code>	succeeds, not approximate	Bns
<code>&scnE;</code>	succeeds but, not (double) equal to	Bnt
<code>&scnsim;</code>	succeeds, not similar	Bnr
<code>&scsim;</code>	succeeds, similar	Bmr
<code>&searhk;</code>	S-E arrow, hooked	Bbb
<code>&searr;</code>	arrow, south-east; decays	Bcj
<code>&sect;</code>	section sign	Bfc
<code>&seswar;</code>	S-E, S-W arrows	Bb3
<code>&sharp;</code>	sharp (music)	Bhx
<code>&shchcy;</code>	shchah – Cyrillic–	CBw
<code>&SHCHcy;</code>	Shchah – Cyrillic –	CCw
<code>&shcy;</code>	shah – Cyrillic–	CBx
<code>&SHcy;</code>	Shah – Cyrillic –	CCx
<code>&Sigma;</code>	sigma (capital) – Greek –	CEs
<code>&sigma;</code>	sigma – Greek –	CDs
<code>&sigmav;</code>	sigma (final) – Greek –	CDv
<code>&sim;</code>	similar; equivalent to; varies linearly with	Bq1
<code>&sime;</code>	similar, equals; asymptotically equal to	Bq2
<code>&simg;</code>	greater than, approximately	Bmh
<code>&siml;</code>	less than and approximately	Bkh
<code>&smile;</code>	up curve, smile	Bm1
<code>&SOFTcy;</code>	Myakhkyy znak – Cyrillic –	CC4
<code>&softcy;</code>	myakhkyy znak – Cyrillic–	CB4
<code>&spades;</code>	spadesuit; spade, filled	Bfj
<code>&sqcap;</code>	square intersection	Bik
<code>&sqcup;</code>	square union	Bij
<code>&sqsub;</code>	square subset; image of	Bok
<code>&sqsube;</code>	square subset, equals	Bol

Entity name	Description	Coordinate
<code>&sqsup;</code>	square superset; original of	Bqk
<code>&sqsupe;</code>	square superset, equals	Bql
<code>&squ;</code>	square; D'Alembertian operator	Bfn
<code>&sqf;</code>	square filled, end of proof; Halmos	Bfo
<code>&star;</code>	star, open	Bfl
<code>&starf;</code>	small (5-point) star, filled	Bf0
<code>&sub;</code>	subset; proper inclusion in set; is implied by	Boc
<code>&Sub;</code>	double subset	Boj
<code>&subE;</code>	subset, double equals	Bog
<code>&sube;</code>	subset, equals; identity or inclusion in set	Bod
<code>&subnE;</code>	subset, not double equal	Bpg
<code>&subne;</code>	subset, not equals	Bpd
<code>&sum;</code>	summation operator	Bja
<code>&Sup;</code>	double superset	Bqj
<code>&sup;</code>	superset; properly includes in set; implies	Bqc
<code>&supe;</code>	superset, equals; ident.with or contains as subset	Bqd
<code>&supE;</code>	superset, double equals	Bqg
<code>&supne;</code>	superset, not equals	Brd
<code>&supnE;</code>	superset, not double equals	Brg
<code>&swarhk;</code>	S-W arrow, hooked	Bba
<code>&swarr;</code>	arrow, south-west	Bcl
<code>&swnwar;</code>	S-W, N-W arrows	Bb4
<code>&szlig;</code>	es-zet (German)	CFs
<code>&tau;</code>	tau – Greek –	CDt
<code>&tcy;</code>	teh – Cyrillic–	CBt
<code>&there4;</code>	therefore	Bru
<code>&theta;</code>	theta (phonetic symbol)	Pft
<code>&Theta;</code>	theta (capital) – Greek –	CEq
<code>&thetav;</code>	theta (cursive, rounded) – Greek –	CDj
<code>&thorn;</code>	thorn (phonetic symbol)	Pbp
<code>&THORN;</code>	THORN (phonetic symbol)	Pcp
<code>&tilde;</code>	tilde (accent)	CAi
<code>&times;</code>	multiplication sign	Bsa
<code>&timesb;</code>	multiplication sign in box	Bs8
<code>&tprime;</code>	triple prime	Bm7
<code>&trade;</code>	trade mark sign (circled TM)	Bht
<code>&trie;</code>	triangle, equal; equal by definition	Bqr
<code>&TScy;</code>	Tseh – Cyrillic –	CCc
<code>&tscy;</code>	tseh – Cyrillic–	CBc
<code>&twixt;</code>	between	Bln
<code>&uArr;</code>	up double arrow; implies	Bcf
<code>&uarr;</code>	upward arrow; increase; exponent	Bce
<code>&uarr2;</code>	two upward arrows	Bct
<code>&Ucy;</code>	Oo – Cyrillic –	CCu
<code>&uharl;</code>	up harpoon left	Bcg
<code>&uharr;</code>	up harpoon right	Bch
<code>&ulcorn;</code>	up left corner	Bd4

Entity name	Description	Coordinate
¨	double dot, umlaut, diaeresis (accent)	CAe
⊎	u plus B: plus sign in union	Bi1
υ	upsilon – Greek –	CDu
ϒ	upsilon (capital) – Greek –	CEu
⌝	corner (phonetic symbol)	Pg2
▵	up triangle open	Bf1
▴	up triangle, filled	Bf5
⇕	up and down double arrow; if and only if	Bcs
↕	up-down arrow; vertical relationship	Bcr
⫫	double perpendicular	Bdr
в	veh – Cyrillic–	CBv
⊩	double vertical, dash	Bdu
⊫	double vertical, double dash	Bdv
⊢	vertical, dash; assertion; reduced to	Bds
⊨	vert., 2-dsh; models; statement is true; result in	Bdx
⊻	logical or, bar below; injective	Biw
⊪	triple vertical, dash	Bdw
≙	estimates; corresponds to	Bqq
℘	Weierstrass elliptic function	Bjo
≀	wreath product	Bsi
⋂	intersection of classes; prod.of cl/sets betw. lmt	Bjg
⋃	union of classes/sets; sum or sets between limits	Bjf
▽	big down triangle open	Bg2
ξ	xi – Greek –	CDx
Ξ	xi (capital) – Greek –	CEx
⨆	big square union	Bjj
⨄	big u plus B: plus sign in big union	Bjl
△	big up triangle open	Bg1
⋁	large supremum	Bjm
⋀	large infimum	Bjn
Я	Yah – Cyrillic –	CCj
я	yah – Cyrillic–	CBj
Ы	Yery – Cyrillic –	CCy
ы	yery – Cyrillic–	CBY
¥	yen sign	Bhf
ю	u – Cyrillic–	CB5
Ю	U – Cyrillic –	CC5
&z.aacute;	extra high, accent (phonetic symbol)	Pa6
&z.And;	double logical and	Bip
&z.archs;	subscript arch (phonetic symbol)	Pr2
&z.arrdl;	rounded arrow down, left	Bcz
&z.arrdr;	rounded arrow down, right	Bcy
&z.atr;	advanced tongue root (phonetic symbol)	Pf3
&z.ausco;	a-underscore	CFu
&z.bar;	bar (phonetic symbol)	Pb5
&z.Barpip;	double-barred pipe (phonetic symbol)	Pg1
&z.betav;	curly beta – Greek –	CD7

Entity name	Description	Coordinate
&z.bigdot;	big dot above (accent)	CAn
&z.btdl;	belted l (phonetic symbol)	Pcl
&z.btmlig;	bottom ligature (phonetic symbol)	Pt2
&z.btyogh;	yogh, bent tail (phonetic symbol)	Pgz
&z.cansls;	cancellation slash (overlay)	CAz
&z.ccirf;	centered small circle, filled	B19
&z.Cint;	principal-value integral: cauchy integral	Bju
&z.cirfb;	circle, bottom filled	Bgw
&z.cirfl;	circle, left filled	Bgt
&z.cirfr;	circle, right filled	Bgu
&z.cirft;	circle, top filled	Bgv
&z.clomeg;	closed omega (phonetic symbol)	Pio
&z.creps;	closed reversed epsilon (phonetic symbol)	Pie
&z.ctl;	curly tail (phonetic symbol)	Pb8
&z.dbnd;	double bond; length as m-dash	Boq
&z.dbnd6;	6-point double bond; length half of m-dash	Bpq
&z.ddfnc;	dotted fence	Bem
&z.defas;	defined as	Bqw
&z.dfnc;	double-rule fence; norm of a matrix	Bdl
&z.dlcorn;	left bottom corner, long	Bd5
&z.drcorn;	right bottom corner, long	Be5
&z.drule;	-45 degree rule	Bow
&z.dshfnc;	dashed fence	Beo
&z.duarr;	dbl arrow, left down, right up	Bcn
&z.duhar2;	harpoon down, up	Bc1
&z.dyogh;	d-Yogh ligature (phonetic symbol)	Pdd
&z.Ehac;	equiangular; equals with hacek	Brq
&z.eint;	edge-integral	Bjz
&z.eng;	eng (phonetic symbol)	Pdn
&z.esh;	esh (phonetic symbol)	Pds
&z.fals;	falling, symbol (phonetic symbol)	Pj7
&z.fhr;	fish-hook r (phonetic symbol)	Pbr
&z.ggrave;	extra low, accent (phonetic symbol)	Pb6
&z.glst;	glottal stop (phonetic symbol)	Pa1
&z.Gt;	much greater than (double)	Bmm
&z.gull;	seagull (phonetic symbol)	Pe3
&z.hbar;	horizontal bar (phonetic symbol)	Pd3
&z.heng;	heng (phonetic symbol)	Pih
&z.herma;	hermaphrodite	Bh8
&z.hex;	hexagon	Bo2
&z.hfl;	guilders sign	Bhe
&z.highs;	high, symbol (phonetic symbol)	Pf7
&z.hlmrk;	half-length mark (phonetic symbol)	Ph2
&z.hris;	high rising, accent (phonetic symbol)	Pc6
&z.hriss;	high rising, symbol (phonetic symbol)	Pc7
&z.hrttrh;	turned h, hook right tail (phonetic symbol)	Pgh
&z.ht;	hooktop (phonetic symbol)	Pa8

Entity name	Description	Coordinate
&z.hvlig;	h-v ligature (phonetic symbol)	Phh
&z.Inf;	double infinum (cumulator)	Bit
&z.inglst;	inverted glottal stop (phonetic symbol)	Pb1
&z.invR;	inverted small capital R (phonetic symbol)	Pir
&z.invv;	inverted v (phonetic symbol)	Pga
&z.invw;	inverted w (phonetic symbol)	Pbw
&z.jup;	Jupiter	Bh5
&z.lam;	laminal (phonetic symbol)	Pa3
&z.Lap;	up triangle open with dot; Laplace operator	Bj5
&z.lbd2bd;	2 bonds on the lefthand side, bottom double	Bn4
&z.lbd2td;	2 bonds on the lefthand side, top double	Bn3
&z.lbond2;	2 bonds on the lefthand side	Bpw
&z.lbond3;	3 bonds on the lefthand side	Bpu
&z.ldang;	left double angle bracket	Bdb
&z.lmrk;	length mark (phonetic symbol)	Pi2
&z.low;	lowering sign (phonetic symbol)	Pc2
&z.lows;	low, symbol (phonetic symbol)	Ph7
&z.lozfl;	lozenge, left filled	Bgg
&z.lozfr;	lozenge, right filled	Bgh
&z.lpargt;	left parenthesis, gt	Bi9
&z.lris;	low rising, accent (phonetic symbol)	Pd6
&z.lriss;	low rising, symbol (phonetic symbol)	Pd7
&z.lsquo;	open single guillemet	CE7
&z.Lt;	much less than (double)	Bkm
&z.ltlmr;	m with leftward tail at right (phonetic symbol)	Pbm
&z.ltlm;	n with left tail at left (phonetic symbol)	Pcn
&z.lyogh;	l-Yogh ligature (phonetic symbol)	Pe1
&z.mdc;	mid centralized (phonetic symbol)	Pq3
&z.merc;	Mercury	Bh3
&z.mho;	mho	CE2
&z.mids;	mid, symbol (phonetic symbol)	Pg7
&z.minhat;	minus with hat	Bts
&z.mstpos;	most positive	Bkz
&z.nasymp;	not asymptotically equivalent	Brw
&z.nbump;	not isomorphic	Brn
&z.nept;	Neptune	Bh9
&z.nesim;	not equal, similar	Bmp
&z.nglpar;	angle and left parentheses	Bk4
&z.ngtneq;	neither greater than nor equivalent to	Bnh
&z.ngtnlt;	neither greater than nor less than	Bni
&z.nlr;	n, long right leg (phonetic symbol)	Pgn
&z.nltneq;	neither less than nor equivalent to	Blh
&z.nltngt;	neither less than nor greater than	Bli
&z.nrarrc;	slashed curly arrow	Bb1
&z.nsubE;	not subset, double equals	Bph
&z.nsubne;	not subset, not equals	Bpe
&z.nsupE;	not superset, double equals	Brh

Entity name	Description	Coordinate
&z.nsupne;	not superset, not equals	Bre
&z.odiv;	circle divide	Bsk
&z.openo;	open o (phonetic symbol)	Pgo
&z.oplusl;	semi-direct sum	Bst
&z.oplusr;	semi-direct sum ???	Bsv
&z.Or;	double logical or	Bio
&z.otimsl;	semi-direct product	Bsu
&z.otimsr;	semi-direct product ???	Bsw
&z.ousco;	o-underscore	CFv
&z.pa;	lower-case a (phonetic symbol)	Paa
&z.palh;	palatization hook (phonetic symbol)	Po2
&z.parl;	parallelogram	Bgz
&z.pbgam;	baby gamma (phonetic symbol)	Peg
&z.pcaph;	capital H (phonetic symbol)	Pfh
&z.pdbdbd;	partial double bond, bottom dashed	Bo4
&z.pdbdtd;	partial double bond, top dashed	Bo3
&z.pdbond;	Partial double bond	Bo8
&z.pent;	pentagon	Bo1
&z.pes;	Pesetas sign	Bhg
&z.pg;	lower-case 'script' g (phonetic symbol)	Pag
&z.pgamma;	gamma (phonetic symbol)	Pdg
&z.plims;	circle and long bar; Plimsol sign	Bs3
&z.ppcnt;	per 10 000	Bhn
&z.pphi;	phi (phonetic symbol)	Pep
&z.pscra;	script a (phonetic symbol)	Pca
&z.pscrsv;	script v (phonetic symbol)	Pbv
&z.pSlash;	double Slash (phonetic symbol)	Pj1
&z.psmca;	small capital A (phonetic symbol)	Pfa
&z.psmcb;	small capital B (phonetic symbol)	Pcb
&z.psmce;	small capital E (phonetic symbol)	Pee
&z.psmcg;	small capital G (phonetic symbol)	Pcg
&z.psmci;	small capital I (phonetic symbol)	Pdi
&z.psmcn;	small capital N (phonetic symbol)	Pfn
&z.psmcr;	small capital R (phonetic symbol)	Phr
&z.psmcu;	small capital U (phonetic symbol)	Pdu
&z.psmcy;	small capital Y (phonetic symbol)	Pcy
&z.ptbdbd;	partial triple bond, bottom dashed	Bo6
&z.ptbtdtd;	partial triple bond, top dashed	Bo5
&z.pupsil;	upsilon (phonetic symbol)	Pcu
&z.qbnd;	quadruple bond; length as m-dash	Bos
&z.qbnd6;	six-point quadruple bond; length half of m-dash	Bps
&z.qprime;	fourfold prime	Bm8
&z.rad;	radical dot	Bo0
&z.rais;	raising sign (phonetic symbol)	Pb2
&z.rarrc;	curly arrow	Ba1
&z.rarrx;	right arrow, crossed	Bbl
&z.rbd2bd;	2 bonds on the righthand side, bottom double	Bn6

Entity name	Description	Coordinate
&z.rbd2td;	2 bonds on the righthand side, top double	Bn5
&z.rbond2;	2 bonds on the righthand side	Bpv
&z.rbond3;	3 bonds on the righthand side	Bpt
&z.ridang;	right double angle bracket	Beb
&z.reapos;	reversed apostrophe (phonetic symbol)	Pk2
&z.refhr;	fish-hook r, reversed (phonetic symbol)	Pjr
&z.refhrl;	reversed fish-hook r, long leg (phonetic symbol)	Plr
&z.reglst;	reversed glottal stop (phonetic symbol)	Pc1
&z.reshtl;	esh reversed, top loop (phonetic symbol)	Pfs
&z.resmck;	small capital K, reversed (phonetic symbol)	Pdk
&z.reve;	reversed e (phonetic symbol)	Pde
&z.reveps;	reversed epsilon (phonetic symbol)	Pge
&z.rh;	right hook (phonetic symbol)	Pp2
&z.rhkd;	right hook, down	Bcx
&z.risfla;	rising-falling, accent (phonetic symbol)	Pe6
&z.risfls;	rising-falling, symbol (phonetic symbol)	Pe7
&z.riss;	rising, symbol (phonetic symbol)	Pi7
&z.rl;	r with long leg (phonetic symbol)	Pcr
&z.Rlarr;	long arrow right, short arrow left	Ba2
&z.rLarr;	short arrow right, long arrow left	Ba3
&z.rndcap;	round cap (phonetic symbol)	Pq2
&z.rparlt;	right parenthesis, less than	Bi8
&z.rsquo;	close single guillemet	CF7
&z.rtd;	right-tail d (phonetic symbol)	Pcd
&z.rtl;	l with right tail (phonetic symbol)	Pdl
&z.rtl;	n with right tail (phonetic symbol)	Pen
&z.rtlr;	r with right tail (phonetic symbol)	Pdr
&z.rtls;	s with right tail (phonetic symbol)	Pcs
&z.rtl;	t with right tail (phonetic symbol)	Pct
&z.rtlz;	z with right tail (phonetic symbol)	Pdz
&z.rtr;	retracted tongue root (phonetic symbol)	Pg3
&z.rtrfhr;	reversed fish-hook r, right tail (phonetic symbol)	Pkr
&z.rtrnr;	turned r with right tail (phonetic symbol)	Pfr
&z.rvbullet;	reversed video bullet	Bg7
&z.S;	S-sign	Bji
&z.sat;	Saturn	Bh6
&z.sbrg;	subscript bridge (phonetic symbol)	Pa2
&z.sbrgt;	subscript bridge, turned (phonetic symbol)	Pa5
&z.sblhr;	left half-ring (phonetic symbol)	Pm2
&z.sbond;	single bond	Bo7
&z.sbrhr;	right half-ring (phonetic symbol)	Pn2
&z.sbs;	small backslash (phonetic symbol)	Pl1
&z.sbw;	subscript w (phonetic symbol)	Pc3
&z.schwa;	schwa (phonetic symbol)	Pbe
&z.scis;	scissor-symbol	Bg8
&z.sfnc;	single-rule fence	Bdk
&z.shtsls;	short slash (overlay)	CAy

Entity name	Description	Coordinate
<code>&z.simne;</code>	approximately but not actually equal to	Brz
<code>&z.sint;</code>	surface integral	Bjw
<code>&z.sqfb;</code>	square, bottom filled	Bfw
<code>&z.sqfl;</code>	square, left filled	Bft
<code>&z.sqfne;</code>	square with filled N-E-corner	Bfp
<code>&z.sqfnw;</code>	square with filled N-W-corner	Bfq
<code>&z.sqfr;</code>	square, right filled	Bfu
<code>&z.sqfse;</code>	square with filled S-E-corner	Bfs
<code>&z.sqfsw;</code>	square with filled S-W-corner	Bfr
<code>&z.sqft;</code>	square, top filled	Bfv
<code>&z.sqh;</code>	legend symbol; horizontally striped box	Bgp
<code>&z.sqint;</code>	lattice-integral	Bj4
<code>&z.sqne;</code>	legend symbol; north-east striped box	Bgs
<code>&z.sqnrsb;</code>	square not reflex subset	Bpl
<code>&z.sqnrsp;</code>	square not reflex superset	Brl
<code>&z.sqnsub;</code>	square not subset	Bpk
<code>&z.sqnsup;</code>	square not superset	Brk
<code>&z.sqsbne;</code>	Square subset, not equal	Bpm
<code>&z.sqshd;</code>	legend symbol; shaded box	Bg6
<code>&z.sqspne;</code>	square superset, not equal	Brm
<code>&z.sqsw;</code>	legend symbol; south-west striped box	Bgr
<code>&z.sqv;</code>	legend symbol; vertically striped box	Bgq
<code>&z.Sup;</code>	double supremum (cumulator)	Bis
<code>&z.syllab;</code>	syllabicity mark (phonetic symbol)	Pf2
<code>&z.tbnd;</code>	triple bond; length as m-dash	Bor
<code>&z.tbnd6;</code>	6-point triple bond; length half of m-dash	Bpr
<code>&z.tdcol;</code>	triple dot colon	Bek
<code>&z.tdfnc;</code>	triple dot fence	Bel
<code>&z.tDot;</code>	triple dot (accent)	CAp
<code>&z.tesh;</code>	t-esh ligature (phonetic symbol)	Pdt
<code>&z.tfnc;</code>	triple vertical-rule fence	Bdm
<code>&z.Theta;</code>	Theta (capital, round)	CEj
<code>&z.Thr;</code>	big square intersection	Bjk
<code>&z.Times;</code>	vector multiplication	Bsb
<code>&z.toplig;</code>	top ligature (phonetic symbol)	Ps2
<code>&z.trgull;</code>	seagull, turned (phonetic symbol)	Pb3
<code>&z.trisla;</code>	triple Slash (phonetic symbol)	Pk1
<code>&z.Trkhk;</code>	Turkish hook (accent)	CAh
<code>&z.trna;</code>	turned a (phonetic symbol)	Pba
<code>&z.trnh;</code>	turned h (phonetic symbol)	Peh
<code>&z.trnk;</code>	turned k (phonetic symbol)	Pck
<code>&z.trnm;</code>	turned m (phonetic symbol)	Pcm
<code>&z.trnmlr;</code>	turned m with long right leg (phonetic symbol)	Pdm
<code>&z.trnomeg;</code>	inverted omega (phonetic symbol)	Pko
<code>&z.trnr;</code>	turned r (phonetic symbol)	Per
<code>&z.trnrl;</code>	turned longlegged r (phonetic symbol)	Pgr
<code>&z.trnsa;</code>	turned script a (phonetic symbol)	Pda

Entity name	Description	Coordinate
<code>&z.trnt;</code>	turned t (phonetic symbol)	Pet
<code>&z.trny;</code>	turned y (phonetic symbol)	Pby
<code>&z.udarr;</code>	dbl arrow, left up, right down; anti-parallel to	Bcm
<code>&z.udhar2;</code>	harpoon up, down	Bc2
<code>&z.urule;</code>	+45 degree rule	Box
<code>&z.utdot;</code>	triple dot, diagonal SW-NE	Bo9
<code>&z.veeBar;</code>	logical or, dbl bar below	Biy
<code>&z.verti;</code>	vertical stroke (inferior) (phonetic symbol)	Pe2
<code>&z.verts;</code>	vertical stroke (superior) (phonetic symbol)	Pd2
<code>&z.vint;</code>	volume integral	Bjx
<code>&z.vrecto;</code>	rectangle open, vertical	Bgy
<code>&z.xhair;</code>	crosshairs; circle and (big) plus sign	Bs4
<code>&z.xhighs;</code>	extra high, symbol (phonetic symbol)	Pa7
<code>&z.xl;</code>	cross, short horizontal line (phonetic symbol)	Pc5
<code>&z.xlows;</code>	extra low, symbol (phonetic symbol)	Pb7
<code>&z.xrat;</code>	cross ratio	Bjh
<code>&z.yogh;</code>	yogh (phonetic symbol)	Pez
<code>&Zcy;</code>	Zeh – Cyrillic –	CCz
<code>&zcy;</code>	zeh – Cyrillic–	CBz
<code>&zeta;</code>	zeta – Greek –	CDz
<code>&zncy;</code>	zheh – Cyrillic–	CB7
<code>&ZHcy;</code>	Zheh – Cyrillic –	CC7

Coordinate	Content	Description
Ba0	 ;	no break (required) space
Ba1	&z.rarrc;	curly arrow
Ba2	&z.Rlarr;	long arrow right, short arrow left
Ba3	&z.rLarr;	short arrow right, long arrow left
Ba9	 	Punctuation space; thousand separator
Baa	&lrhar2;	left over right harpoon; reversible reaction
Bab	&rlhar2;	right over left harpoon; reversible reaction
Bac	&lrarr2;	left over right arrow; reversible reaction
Bad	&rlarr2;	right over left arrow; reversible reaction
Bae	↩	left arrow-hooked
Baf	↼	left harpoon-up
Bag	←	left arrow; relata of a relation
Bah	⇐	left double arrow; is implied by
Bai	↭	left and right arrow-wavy
Baj	↝	right arrow-wavy; functional relationship
Bak	↪	right arrow-hooked
Bal	⇀	right harpoon-up
Bam	→	right arrow; approaches
Ban	⇒	right double arrow; implies
Bao	↦	mapping; maps to
Bap	⇛	right triple arrow
Baq	⇚	left triple arrow
Bar	↔	left-right arrow; mutually implies
Bas	⇔	left-right dbl arrow; if and only if; mut. implies
Bat	&rarr2;	two right arrows
Bau	&larr2;	two left arrows
Bav	↞	two-head left arrow
Baw	↠	two-head right arrow; on to map
Bax	⤅	two-head right arrow, ended
Bay	↢	left arrow-tailed
Baz	↣	right arrow-tailed
Bb1	&z.nrarrc;	slashed curly arrow
Bb2	⤨	N-E, S-E arrows
Bb3	⤩	S-E, S-W arrows
Bb4	⤪	S-W, N-W arrows
Bb5	⤧	N-W, N-E arrows
Bba	⤦	S-W arrow, hooked
Bbb	⤥	S-E arrow, hooked
Bbc	⤣	N-W arrow, hooked
Bbd	⤤	N-E arrow, hooked
Bbe	↫	looparrowleft A: l arrow-looped
Bbf	↽	leftharpoondown A: l harpoon-down
Bbg	↚	not left arrow
Bbh	⇍	not left double arrow; not implied by
Bbj	⇁	rightharpoondown A: r harpoon-down
Bbk	↬	looparrowright A: r arrow-looped

Coordinate	Content	Description
Bbl	<code>&z.rarrx;</code>	right arrow, crossed
Bbm	<code>&nrarr;</code>	not right arrow; does not tend to
Bbn	<code>&nrArr;</code>	not right double arrow; does not imply
Bbp	<code>&olarr;</code>	** circlearrowleft A: l arrow in circle
Bbq	<code>&orarr;</code>	** circlearrowright A: r arrow in circle
Bbr	<code>&nharr;</code>	not left-right arrow
Bbs	<code>&nhArr;</code>	not left-right dbl arrow; negation of mut. implies
Bbw	<code>&lsh;</code>	Lsh A: **left hook arrow up
Bc1	<code>&z.duhar2;</code>	harpoon down, up
Bc2	<code>&z.udhar2;</code>	harpoon up, down
Bca	<code>&dharl;</code>	down harpoon left
Bcb	<code>&dharr;</code>	down harpoon right
Bcc	<code>&darr;</code>	downward arrow; decreases
Bcd	<code>&dArr;</code>	down double arrow; implies
Bce	<code>&uarr;</code>	upward arrow; increase; exponent
Bcf	<code>&uArr;</code>	up double arrow; implies
Bcg	<code>&uharl;</code>	up harpoon left
Bch	<code>&uharr;</code>	up harpoon right
Bci	<code>&nwarr;</code>	arrow, north-west
Bcj	<code>&searr;</code>	arrow, south-east; decays
Bck	<code>&nearr;</code>	arrow, north-east; grows
Bcl	<code>&swarr;</code>	arrow, south-west
Bcm	<code>&z.udarr;</code>	dbl arrow, left up, right down; anti-parallel to
Bcn	<code>&z.duarr;</code>	dbl arrow, left down, right up
Bcp	<code>&cularr;</code>	left curved arrow; anti-clockwise arrow
Bcq	<code>&curarr;</code>	right curved arrow; clockwise arrow
Bcr	<code>&varr;</code>	up-down arrow; vertical relationship
Bcs	<code>&vArr;</code>	up and down double arrow; if and only if
Bct	<code>&uarr2;</code>	two upward arrows
Bcu	<code>&darr2;</code>	two downward arrows
Bcw	<code>&rsh;</code>	Rsh A: **right hook arrow up
Bcx	<code>&z.rhkd;</code>	right hook, down
Bcy	<code>&z.arrdr;</code>	rounded arrow down, right
Bcz	<code>&z.arrdl;</code>	rounded arrow down, left
Bd1	<code>&lflor;</code>	left floor; topless left bracket
Bd2	<code>&lceil;</code>	left ceiling; bottomless left bracket
Bd3	<code>&dlcorn;</code>	down left corner
Bd4	<code>&ulcorn;</code>	up left corner
Bd5	<code>&z.dlcorn;</code>	left bottom corner, long
Bd6	<code>&mid;</code>	shortmid R: (Height of small x)
Bd7	<code>&par;</code>	shortparallel R: short parallel (Height small x)
Bda	<code>&lang;</code>	left angle bracket
Bdb	<code>&z.ldang;</code>	left double angle bracket
Bdc	<code>&llobrk;</code>	left open bracket
Bdd	<code>&loang;</code>	left open angular bracket
Bdi	<code>&mid;</code>	divides; mid (Height of capital I)

Coordinate	Content	Description
Bdj	∥	parallel to (height of capital I)
Bdk	&z.sfunc;	single-rule fence
Bdl	&z.dfunc;	double-rule fence; norm of a matrix
Bdm	&z.tfunc;	triple vertical-rule fence
Bdp	⊥	perpendicular; orthogonal to
Bdq	⊺	intercal; true
Bdr	⫫	double perpendicular
Bds	⊢	vertical, dash; assertion; reduced to
Bdt	⊣	dash, vertical; turnstile
Bdu	⊩	double vertical, dash
Bdv	⊫	double vertical, double dash
Bdw	⊪	triple vertical, dash
Bdx	⊨	vert., 2-dsh; models; statement is true; result in
Bdy	⥽	right fish tail; element precedes under relation;
Be1	⌋	right floor; topless right bracket
Be2	⌉	right ceiling; bottomless right bracket
Be3	⌟	down right corner
Be4	⌝	up right corner
Be5	&z.drcorn;	right bottom corner, long
Be6	∤	nshortmid
Be7	∦	nshortparallel N: not short par
Bea	⟩	right angle bracket
Beb	&z.rdang;	right double angle bracket
Bec	⟧	right open bracket
Bed	⟭	right open angular bracket
Bei	∤	not mid
Bej	∦	not parallel
Bek	&z.tdcol;	triple dot colon
Bel	&z.tdfnc;	triple dot fence
Bem	&z.ddfnc;	dotted fence
Ben	¦	broken vertical bar
Beo	&z.dshfnc;	dashed fence
Bes	⊬	not vertical, dash
Beu	⊮	not double vertical, dash
Bev	⊯	not double vertical, double dash
Bex	⊭	not vertical, double-dash
Bey	⥼	left fish tail
Bf1	▵	up triangle open
Bf2	▿	down triangle open
Bf3	▹	right triangle open
Bf4	◃	left triangle open
Bf5	▴	up triangle, filled
Bf6	▾	down triangle, filled
Bf7	▸	right triangle, filled
Bf8	◂	left triangle, filled
Bfa	†	dagger

Coordinate	Content	Description
Bfc	§	section sign
Bfd	¶	paragraph sign; pilcrow
Bfe	✠	Maltese cross
Bff	✓	check mark; tick
Bfg	⋄	diamond
Bfh	♦	diamondsuit; diamond, filled
Bfi	♥	heartsuit; heart, filled
Bfj	♠	spadesuit; spade, filled
Bfk	♣	clubsuit; club, filled
Bfl	☆	star, open
Bfm	★	big (5-point) star, filled
Bfn	□	square; D'Alembertian operator
Bfo	▪	square filled, end of proof; Halmos
Bfp	&z.sqfne;	square with filled N-E-corner
Bfq	&z.sqfnw;	square with filled N-W-corner
Bfr	&z.sqfsw;	square with filled S-W-corner
Bfs	&z.sqfse;	square with filled S-E-corner
Bft	&z.sqfl;	square, left filled
Bfu	&z.sqfr;	square, right filled
Bfv	&z.sqft;	square, top filled
Bfw	&z.sqfb;	square, bottom filled
Bg1	△	big up triangle open
Bg2	&xdttri;	big down triangle open
Bg6	&z.sqshd;	legend symbol; shaded box
Bg7	&z.rvbull;	reversed video bullet
Bg8	&z.scis;	scissor-symbol
Bg9	☎	telephone-symbol
Bga	‡	double dagger; diesis
Bgf	◊	lozenge open; total mark
Bgg	&z.lozfl;	lozenge, left filled
Bgh	&z.lozfr;	lozenge, right filled
Bgi	♦	lozenge, filled
Bgn	○	circle, open
Bgo	•	filled circle; bullet
Bgp	&z.sqh;	legend symbol; horizontally striped box
Bgq	&z.sqv;	legend symbol; vertically striped box
Bgr	&z.sqsw;	legend symbol; south-west striped box
Bgs	&z.sqne;	legend symbol; north-east striped box
Bgt	&z.cirfl;	circle, left filled
Bgu	&z.cirfr;	circle, right filled
Bgv	&z.cirft;	circle, top filled
Bgw	&z.cirfb;	circle, bottom filled
Bgx	▭	rectangle open, horizontal
Bgy	&z.vrecto;	rectangle open, vertical
Bgz	&z.parl;	parallelogram
Bh3	&z.merc;	Mercury

Coordinate	Content	Description
Bh4	♀	Venus; female
Bh5	&z.jup;	Jupiter
Bh6	&z.sat;	Saturn
Bh7	♂	Mars; male
Bh8	&z.herma;	hermaphrodite
Bh9	&z.nept;	Neptune
Bha	&	ampersand
Bhb	¢	cent sign
Bhc	\$	dollar sign
Bhd	£	pound sign
Bhe	&z.hfl;	guilders sign
Bhf	¥	yen sign
Bhg	&z.pes;	Pesetas sign
Bhj	ð	ed
Bhm	‰	per thousand; per mille
Bhn	&z.ppcnt;	per 10 000
Bhr	©	copyright sign (circled C)
Bhs	®	registered sign (circled R)
Bht	™	trade mark sign (circled TM)
Bhw	♭	flat (music)
Bhx	♯	sharp (music)
Bhy	♮	natural (music)
Bi0	⦔	right parenthesis, greater
Bi1	◃	left elongated triangle; implied by
Bi2	⋫	not right triangle
Bi4	⋪	not left triangle
Bi7	⦓	left parenthesis, less than
Bi8	&z.rparlt;	right parenthesis, less than
Bi9	&z.lpargt;	left parenthesis, gt
Bia	∀	inverted capital A; for all
Bib	∃	reversed cap. E; there exists; at least one exists
Bic	∄	not rev. cap. E; not exists; there does not exist
Bid	∁	complement
Bif	∪	sum or union of classes or sets; logical sum
Big	∩	prod. of intrsctn of cl./sets; vee; small intrsctn
Bih	⋓	double union; (Cup)
Bii	⋒	double intersection; (Cap)
Bij	⊔	square union
Bik	⊓	square intersection
Bil	⊎	u plus B: plus sign in union
Bim	∨	logical or; small supremum
Bin	∧	logical and; small infimum; wedge
Bio	&z.Or;	double logical or
Bip	&z.And;	double logical and
Biq	⩔	double supremum (conjunction); double logical or
Bir	⩓	double infimum (conjunction); double logical and

Coordinate	Content	Description
Bis	&z.Sup;	double supremum (cumulator)
Bit	&z.Inf;	double infimum (cumulator)
Biu	⋏	curly logical and
Biv	⋎	curly logical or
Biw	⊻	logical or, bar below; injective
Bix	⌅	logical and, bar above; projective
Biy	&z.veeBar;	logical or, dbl bar below
Biz	⌆	double bar wedge B; log and, dbl bar
Bj1	&acoint;	contour integral, anti-clockwise
Bj2	&ccoint;	contour integral, clockwise
Bj3	∱	clockwise integral
Bj4	&z.sqint;	lattice-integral
Bj5	&z.Lap;	up triangle open with dot; Laplace operator
Bja	∑	summation operator
Bjb	∏	product operator
Bjc	∐	inverted product (cumulator)
Bjd	⨿	inverted prod. (conjunction); amalgamation, coprod
Bje	√	root; radical sign
Bjf	⋃	union of classes/sets; sum or sets between limits
Bjg	⋂	intersection of classes; prod.of cl/sets betw. lmt
Bjh	&z.xrat;	cross ratio
Bji	&z.S;	S-sign
Bjj	&xscup;	big square union
Bjk	&z.Thr;	big square intersection
Bjl	⨄	big u plus B: plus sign in big union
Bjm	⋁	large supremum
Bjn	⋀	large infimum
Bjo	℘	Weierstrass elliptic function
Bjp	∫	integral operator
Bju	&z.Cint;	principal-value integral: cauchy integral
Bjv	∮	contour integral; circuital integral
Bjw	&z.sint;	surface integral
Bjx	&z.vint;	volume integral
Bjz	&z.eint;	edge-integral
Bk1	∠	angle
Bk2	∡	angle-measured
Bk3	∢	spherical angle
Bk4	&z.nglpar;	angle and left parentheses
Bk5	&ang90;	right (90 degree) angle; factorial sign
Bk6	&iproduct;	intprod
Bk7	°	degree sign
Bk8	*	mid asterisk
Bk9	∘	centered circle; composite function; convolution
Bka	<	less than sign
Bkb	⩽	less than or equal to, slanted
Bkc	⪕	equal-or-less, slanted

Coordinate	Content	Description
Bkd	≤	less than or equal
Bke	≦	less than or (double) equal
Bkf	≲	less than or similar to; less, approximate
Bkg	⪅	less than and double approximate
Bkh	⪝	less than and approximately
Bki	≶	less than or greater than
Bkj	⋚	less, equal, or greater
Bkk	⪋	less, (double) equal, or greater
Bkl	≪	much less than (double)
Bkm	&z.Lt;	much less than (double)
Bkn	⋘	much less than (triple)
Bko	&ldot;	less dot R: less than, with dot
Bkp	≂	** equal, similar
Bkq	≺	precedes; has lower rank than; is dominated by
Bkr	≾	precedes, similar; dominance; contained in, equiv.
Bks	⪷	precedes, approximate
Bkt	⪯	preceq R: precedes, equals
Bku	≼	curly prec. equal; has rank lower than or equal to
Bkv	⋞	curly equals (above), precedes
Bkz	&z.mstpos;	most positive
BI0	★	small (5-point) star, filled
BI5	‵	backprime; reverse prime
BI8	*	pseudo-superscript asterisk (ASCII *)
BI9	&z.ccirf;	centered small circle, filled
Bla	≮	not less than
Blb	⩽̸	neither less than nor equal to, slanted
Bld	⪇	less than but not equals
Ble	≨	less than but not (double) equal to
Blf	⋦	less than, not similar
Blg	⪉	less than but not approximate
Blh	&z.nltneq;	neither less than nor equivalent to
Bli	&z.nltngt;	neither less than nor greater than
Blj	≰	nleq N: not less-than-or-equal
Blk	≦̸	nleq N: not less, dbl equals
Bin	≬	between
Blq	⊀	does not precede
Blr	⋨	precedes, not similar
Bls	⪹	precedes, not approximately
Blt	⪵	precedes, not double equal
Blu	⪯̸	npreceq N: not precedes, equals
Blz	∞	infinity sign
Bm1	⌣	up curve, smile
Bm2	⌢	down curve, frown
Bm3	⋔	pitchfork
Bm5	′	prime; minutes; feet
Bm6	″	double prime; seconds; inches

Coordinate	Content	Description
Bm7	‴	triple prime
Bm8	&z.qprime;	fourfold prime
Bm9	…	triple dot
Bma	;	greater than sign
Bmb	⩾	greater than or equal to, slanted
Bmc	⪖	equal-or-greater, slanted
Bmd	≥	greater than or equal to
Bme	≧	greater than or double equal to
Bmf	≳	greater than or similar to; greater than approx.
Bmg	⪆	greater than, approximately
Bmh	⪞	greater than, approximately
Bmi	≷	greater than or less than
Bmj	⋛	greater, equal, or less
Bmk	⪌	greater, (double) equal, or less
Bml	≫	much greater than (double)
Bmm	&z.Gt;	much greater than (double)
Bmn	⋙	much greater than (triple)
Bmo	ġ	greater dot R: greater than, with dot
Bmp	&z.nesim;	not equal, similar
Bmq	≻	succeeds; has higher rank than; dominates
Bmr	≿	succeeds, similar
Bms	⪸	succeeds, approximate
Bmt	⪰	succeq R: succeeds, equals
Bmu	≽	succ. curly eq; has rank higher than or equal to
Bmv	⋟	curly equals (above), succeeds
Bmz	∝	is proportional to; varies as
Bn3	&z.lbd2td;	2 bonds on the lefthand side, top double
Bn4	&z.lbd2bd;	2 bonds on the lefthand side, bottom double
Bn5	&z.rbd2td;	2 bonds on the righthand side, top double
Bn6	&z.rbd2bd;	2 bonds on the righthand side, bottom double
Bn9	⋯	triple dot, centered
Bna	≯	not greater than
Bnb	⩾̸	neither greater than nor equal to, slanted
Bnd	⪈	greater than, not equals to
Bne	≩	greater than but not (double) equal to
Bnf	⋧	greater than but not similar to
Bng	⪊	greater than but not approximate
Bnh	&z.ngtneq;	neither greater than nor equivalent to
Bni	&z.ngtnlt;	neither greater than nor less than
Bnj	≱	ngeq N: not greater-than-or-equal
Bnk	≧̸	ngeqq N: not greater, dbl equals
Bnq	⊁	does not succeed
Bnr	⋩	succeeds, not similar
Bns	⪺	succeeds, not approximate
Bnt	⪶	succeeds but, not (double) equal to
Bnu	⪰̸	nsucceq N: not succeeds, equals

Coordinate	Content	Description
Bo0	&z.rad;	radical dot
Bo1	&z.pent;	pentagon
Bo2	&z.hex;	hexagon
Bo3	&z.pdbdtd;	partial double bond, top dashed
Bo4	&z.pdbdbd;	partial double bond, bottom dashed
Bo5	&z.ptbdttd;	partial triple bond, top dashed
Bo6	&z.ptbdbd;	partial triple bond, bottom dashed
Bo7	&z.sbdn;	single bond
Bo8	&z.pdbond;	Partial double bond
Bo9	&z.utdot;	triple dot, diagonal SW-NE
Boa	∈	set membership; member
Boc	⊂	subset; proper inclusion in set; is implied by
Bod	⊆	subset, equals; identity or inclusion in set
Bog	⫅	subset, double equals
Boj	⋐	double subset
Bok	⊏	square subset; image of
Bol	⊑	square subset, equals
Boo	⊸	multimap A:
Bop	⊷	image of
Boq	&z.dbnd;	double bond; length as m-dash
Bor	&z.tbnd;	triple bond; length as m-dash
Bos	&z.qbnd;	quadruple bond; length as m-dash
Bow	&z.drule;	-45 degree rule
Box	&z.urule;	+45 degree rule
Bp9	&dttdot;	triple dot, diagonal NW-SE
Bpa	∉	not an element of; is not a member of
Bpc	&nsb;	not subset; non-proper inclusion in set
Bpd	⊊	subset, not equals
Bpe	&z.nsubne;	not subset, not equals
Bpf	⊈	not subset, equals; not contained in or not eql to
Bpg	⫋	subset, not double equal
Bph	&z.nsubE;	not subset, double equals
Bpi	⫅̸	not subset, double equals
Bpk	&z.sqnsb;	square not subset
Bpl	&z.sqnrsb;	square not reflex subset
Bpm	&z.sqsbne;	Square subset, not equal
Bpp	⊶	original of
Bpq	&z.dbnd6;	6-point double bond; length half of m-dash
Bpr	&z.tbnd6;	6-point triple bond; length half of m-dash
Bps	&z.qbnd6;	six-point quadruple bond; length half of m-dash
Bpt	&z.rbond3;	3 bonds on the righthand side
Bpu	&z.lbond3;	3 bonds on the lefthand side
Bpv	&z.rbond2;	2 bonds on the righthand side
Bpw	&z.lbond2;	2 bonds on the lefthand side
Bpz	∼	** most positive
Bq0	&homthr;	homothetic

Coordinate	Content	Description
Bq1	<code>&sim;</code>	similar; equivalent to; varies linearly with
Bq2	<code>&sime;</code>	similar, equals; asymptotically equal to
Bq3	<code>&cong;</code>	congruent with; similar to
Bq4	<code>&ap;</code>	approximate; asymptotic
Bq5	<code>&ape;</code>	approximate, equals; asymptotic or equal to
Bq6	<code>&apid;</code>	triple tilde; approximately identical to
Bq7	<code>&bsim;</code>	reverse mainline tilde; reverse similar
Bq8	<code>&bsime;</code>	reverse similar, equals
Bq9	<code>&bcong;</code>	reverse congruent
Bqa	<code>&ni;</code>	contains; owns; includes
Bqc	<code>&sup;</code>	superset; properly includes in set; implies
Bqd	<code>&supe;</code>	superset, equals; ident.with or contains as subset
Bqg	<code>&supE;</code>	superset, double equals
Bqj	<code>&Sup;</code>	double superset
Bqk	<code>&sqsup;</code>	square superset; original of
Bql	<code>&sqsupe;</code>	square superset, equals
Bqm	<code>&equest;</code>	equal, questionmark
Bqn	<code>&cire;</code>	circ R: circle, equals
Bqo	<code>&edot;</code>	equals, dot above; approaches the limit
Bqp	<code>&eDot;</code>	equals, even dots; approximately equal
Bqq	<code>&wedgeq;</code>	estimates; corresponds to
Bqr	<code>&trie;</code>	triangle, equal; equal by definition
Bqs	<code>&ecir;</code>	circle in equals sign
Bqt	<code>&colone;</code>	colon, equals; is defined as
Bqu	<code>&ecolon;</code>	equals, colon; defines
Bqv	<code>&eDDot;</code>	equal, double dot above and under
Bqw	<code>&z.defas;</code>	defined as
Bqx	<code>&equiv;</code>	equivalent; identical with; triple equals
Bqy	<code>&erDot;</code>	rising dots equal R: eq, rising dots
Bqz	<code>&efDot;</code>	equals, falling dots; appr. equal to; image of
Br1	<code>&nsim;</code>	not similar; not equivalent to
Br2	<code>&nsime;</code>	not similar, equals; not asymptotically equal to
Br3	<code>&ncong;</code>	not congruent with; neither appr. nor act. equal
Br4	<code>&nap;</code>	not approximate; not asymptotic to
Br6	<code>&napid;</code>	not approximately, double; dashed triple tilde
Bra	<code>&notni;</code>	does not contain as a member
Brc	<code>&nsup;</code>	not superset; does not properly include in set
Brd	<code>&supne;</code>	superset, not equals
Bre	<code>&z.nsupne;</code>	not superset, not equals
Brf	<code>&nsupe;</code>	not superset, equals; does not contain as subset
Brg	<code>&supnE;</code>	superset, not double equals
Brh	<code>&z.nsupE;</code>	not superset, double equals
Bri	<code>&nsupE;</code>	not superset, double equals
Brk	<code>&z.sqnsup;</code>	square not superset
Brl	<code>&z.sqnrsp;</code>	square not reflex superset
Brm	<code>&z.sqspne;</code>	square superset, not equal

Coordinate	Content	Description
Brn	<code>&z.nbump;</code>	not isomorphic
Bro	<code>&not;</code>	logical not sign
Brp	<code>&bumpe;</code>	bumpy equals, equals; approximately equal to
Brq	<code>&z.Ehac;</code>	equiangular; equals with hacek
Brr	<code>&bump;</code>	bumpy equals; geometrically equiv. to; appr. equal
Brs	<code>&asymp;</code>	cupcap; asymptotically equal to
Brt	<code>&becaus;</code>	because
Bru	<code>&there4;</code>	therefore
Brv	<code>&ne;</code>	not equal to
Brw	<code>&z.nasymp;</code>	not asymptotically equivalent
Brx	<code>&nequiv;</code>	not equivalent, not identical with
Brz	<code>&z.simne;</code>	approximately but not actually equal to
Bs1	<code>&emptyv;</code>	solidus in circle; empty set; null set; diameter
Bs2	<code>&oast;</code>	circled asterisk
Bs3	<code>&z.plims;</code>	circle and long bar; Plimsol sign
Bs4	<code>&z.xhair;</code>	crosshairs; circle and (big) plus sign
Bs6	<code>&minusb;</code>	minus sign in box
Bs7	<code>&plusb;</code>	plus sign in box
Bs8	<code>&timesb;</code>	multiplication sign in box
Bsa	<code>&times;</code>	multiplication sign
Bsb	<code>&z.Times;</code>	vector multiplication
Bsc	<code>&middot;</code>	center dot
Bsd	<code>&ltimes;</code>	times sign, left closed
Bse	<code>&rtimes;</code>	times sign, right closed
Bsf	<code>&bowtie;</code>	bowtie
Bsg	<code>&rthree;</code>	right three times
Bsh	<code>&lthree;</code>	left three times
Bsi	<code>&wreath;</code>	wreath product
Bsk	<code>&z.odiv;</code>	circle divide
Bsl	<code>&odash;</code>	circled dash B: hyphen in circle
Bsm	<code>&osol;</code>	o slash B: solidus in circle
Bsn	<code>&ocir;</code>	circled circ B: open dot in circle
Bso	<code>&odot;</code>	middle dot in circle; sun-symbol; Tensor product
Bsp	<code>&ominus;</code>	minus sign in circle; symmetric difference
Bsq	<code>&ovbar;</code>	circle, and vertical bar
Bsr	<code>&oplus;</code>	plus sign in circle; direct sum; earth sign
Bss	<code>&otimes;</code>	multiplication sign in circle; direct product
Bst	<code>&z.oplusl;</code>	semi-direct sum
Bsu	<code>&z.otimsl;</code>	semi-direct product
Bsv	<code>&z.oplusr;</code>	semi-direct sum ???
Bsw	<code>&z.otimsr;</code>	semi-direct product ???
Bta	<code>&doplus;</code>	plus sign, dot below; tight dotted plus
Btb	<code>&plusdo;</code>	plus sign, dot above; direct sum
Btc	<code>&plusmn;</code>	plus or minus sign
Btd	<code>&mpplus;</code>	minus or plus sign
Bte	<code>&hercon;</code>	hermitian conjugative matrix

Coordinate	Content	Description
Btf	⋇	divide on times B: division on times
Btl	−	minus sign
Btm	&dminus;	minus with dot beneath; tight dotted minus
Btn	∸	minus with dot above; symmetric difference
Bto	÷	division sign
Btp	∺	geometric properties
Btq	–	en dash (long hyphen), copymarked 1/N
Btr	—	em dash , copymarked 1/M
Bts	&z.minhat;	minus with hat
Btt	∷	four dots in square; as
Btu	⊴	triangle left eq R: left triangle, equal
Btv	⊵	triangle right eq R: right tri, eq
Btw	⋬	ntriangleleftteq N: not l tri, eq
Btx	⋭	ntrianglerighteq N: not r tri, eq
Bu0	∅	slashed zero; empty set
Buc	<ac>C</ac><ac>&z.xl;</ac>	Cambrium (era)
Bug	ℏ	Planck's constant (italic)
Buh	ℏ	Planck constant; h-bar (Dirac)
Buk	ℓ	roman script-l
Buw	<a><ac>A</ac><ac>˚</ac>	angstrom
CAa	´	acute (accent)
CAb	`	grave (accent)
CAc	˝	double acute (accent)
CAd	ˆ	circumflex,Caret (accent)
CAe	¨	double dot, umlaut, diaeresis (accent)
CAg	˚	circle (accent)
CAh	&z.Trkhk;	Turkish hook (accent)
CAi	˜	tilde (accent)
CAj	˘	breve (accent)
CAk	ˇ	Hacek (Czech.), caron, wedge (accent)
CAl	¸	cedilla (accent)
CAm	¯	overbar, macron (accent)
CAn	&z.bigdot;	big dot above (accent)
CAo	˙	dot above (accent)
CAp	&z.tDot;	triple dot (accent)
CAq	⃜	quadruple dot (accent)
CAx	˛	polish hook, Ogonek (accent)
CAy	&z.shts/s;	short slash (overlay)
CAz	&z.cans/s;	cancellation slash (overlay)
CB1	э	eh – Cyrillic –
CB2	i	Ukrainian i – Cyrillic–
CB3	й	ee kratkoyeh – Cyrillic–
CB4	ь	myakhkyy znak – Cyrillic–
CB5	ю	u – Cyrillic–

Coordinate	Content	Description
CB6	ъ	tvjordyy znak – Cyrillic–
CB7	&zhecy;	zheh – Cyrillic–
CBa	a	ah – Cyrillic–
CBb	б	beh – Cyrillic–
CBc	ц	tseh – Cyrillic–
CBd	д	deh – Cyrillic–
CBe	e	yeh – Cyrillic–
CBf	ф	ef – Cyrillic–
CBg	г	geh – Cyrillic–
CBh	x	khah – Cyrillic–
CBi	и	ee – Cyrillic–
CBj	я	yah – Cyrillic–
CBk	к	kah – Cyrillic–
CBl	л	el – Cyrillic–
CBm	м	em – Cyrillic–
CBn	н	en – Cyrillic–
CBo	o	aw – Cyrillic–
CBp	п	peh – Cyrillic–
CBq	&khecy;	tcheh – Cyrillic–
CBr	p	ehr – Cyrillic–
CBs	c	es – Cyrillic–
CBt	т	teh – Cyrillic–
CBu	y	oo – Cyrillic–
CBv	в	veh – Cyrillic–
CBw	&shehcy;	shehah – Cyrillic–
CBx	ш	shah – Cyrillic–
CBy	ы	yery – Cyrillic–
CBz	з	zeh – Cyrillic–
CC1	Э	Eh – Cyrillic –
CC2	I	Ukrainian I – Cyrillic –
CC3	Й	Ee kratkoyeh – Cyrillic –
CC4	Ь	Myakhkyy znak – Cyrillic –
CC5	Ю	U – Cyrillic –
CC6	Ъ	Tvjordyy znak – Cyrillic –
CC7	Ж	Zheh – Cyrillic –
CCa	A	Ah – Cyrillic –
CCb	Б	Beh – Cyrillic –
CCc	Ц	Tseh – Cyrillic –
CCd	Д	Deh – Cyrillic –
CCe	E	Yeh – Cyrillic –
CCf	Ф	Ef – Cyrillic –
CCg	Г	Geh – Cyrillic –
CCh	X	Khah – Cyrillic –
CCi	И	Ee – Cyrillic –
CCj	Я	Yah – Cyrillic –
CCk	К	Kah – Cyrillic –

Coordinate	Content	Description
CCl	Л	El – Cyrillic –
CCm	M	Em – Cyrillic –
CCn	H	En – Cyrillic –
CCo	O	Aw – Cyrillic –
CCp	П	Peh – Cyrillic –
CCq	Х	Tchek – Cyrillic –
CCr	P	Ehr – Cyrillic –
CCs	C	Es – Cyrillic –
CCt	T	Teh – Cyrillic –
CCu	У	Oo – Cyrillic –
CCv	B	Veh – Cyrillic –
CCw	Щ	Shchah – Cyrillic –
CCx	Ш	Shah – Cyrillic –
CCy	Ы	Yery – Cyrillic –
CCz	З	Zeh – Cyrillic –
CD0	℩	inverted iota – Greek –
CD2	ϖ	”physicians’ pi” – Greek –
CD3	ϵ	epsilon (cursive) – Greek –
CD4	ϕ	phi (cursive,open) – Greek –
CD5	ϝ	digamma
CD6	∂	curly d; differential – Greek –
CD7	&z.betav;	curly beta – Greek –
CD8	ϰ	kappa (cursive,rounded) – Greek –
CD9	ϱ	rho (cursive, round) – Greek –
CDa	α	alpha – Greek –
CDb	β	beta – Greek –
CDc	χ	chi – Greek –
CDd	δ	delta – Greek –
CDe	ε	epsilon (Porson) – Greek –
CDf	φ	phi – Greek –
CDg	γ	gamma – Greek –
CDh	η	eta – Greek –
CDi	ι	iota – Greek –
CDj	ϑ	theta (cursive, rounded) – Greek –
CDk	κ	kappa – Greek –
CDl	λ	lambda – Greek –
CDm	μ	mu – Greek –
CDn	ν	nu – Greek –
CDo	&omicr;	omicron – Greek –
CDp	π	pi – Greek –
CDq	θ	theta – Greek –
CDr	ρ	rho – Greek –
CDs	σ	sigma – Greek –
CDt	τ	tau – Greek –
CDu	&ups;	upsilon – Greek –
CDv	ς	sigma (final) – Greek –

Coordinate	Content	Description
CDw	ω	omega – Greek –
CDx	ξ	xi – Greek –
CDy	ψ	psi – Greek –
CDz	ζ	zeta – Greek –
CE0	“	double quotation mark, left
CE1	∇	differential vector; nabla;
CE2	&z.mho;	mho
CE7	&z.lsquo;	open single guillemet
CE8	«	open double guillemet; angle open quote
CE9	‘	single quotation mark, left
CEa	A	capital alpha – Greek –
CEb	B	capital beta – Greek –
CEc	X	capital chi – Greek –
CEd	Δ	delta (capital); increment – Greek –
CEe	E	capital epsilon – Greek –
CEf	Φ	phi (capital) – Greek –
CEg	Γ	gamma (capital) – Greek –
CEh	H	capital eta – Greek –
CEi	I	capital iota – Greek –
CEj	&z.Theta;	Theta (capital, round)
CEk	K	capital kappa – Greek –
CEl	Λ	lambda (capital) – Greek –
CEm	M	capital mu – Greek –
CEn	N	capital nu – Greek –
CEo	O	capital omicron – Greek –
CEp	Π	pi (capital) – Greek –
CEq	Θ	theta (capital) – Greek –
CEr	P	capital rho – Greek –
CEs	Σ	sigma (capital) – Greek –
CEt	T	capital tau – Greek –
CEu	Υ	upsilon (capital) – Greek –
CEw	Ω	omega (capital) – Greek –
CEx	Ξ	xi (capital) – Greek –
CEy	Ψ	psi (capital) – Greek –
CEz	Z	capital zeta – Greek –
CF0	”	double quotation mark, right
CF7	&z.rsquo;	close single guillemet
CF8	»	close double guillemet; angle close quote
CF9	’	single quotation mark, right
CFa	æ	ligature ae
CFb	Æ	ligature AE
CFc	<ac>d</ac><ac>&z.xl</ac>	crossed l.c. d
CFd	<ac>D</ac><ac>&z.xl</ac>	crossed cap. D
CFe	œ	ligature oe

Coordinate	Content	Description
CFf	Œ	ligature OE
CFh	ı	undotted l.c. i
CFi	&jnodot;	undotted l.c. j
CFl	<ac>l</ac><ac>&z.xl</ac>	crossed l.c. l
CFm	<ac>L</ac><ac>&z.xl</ac>	crossed cap. L
CFo	ø	small o, slashed
CFp	Ø	capital O, slashed
CFs	ß	es-zet (German)
CFu	&z.usco;	a-underscore
CFv	&z.ousco;	o-underscore
CGe	¡	inverted exclamation mark (Spanish)
CGq	¿	inverted question mark (Spanish)
CHa	ℵ	Aleph (Hebrew)
CHb	ℶ	Beth (Hebrew)
CHc	ℸ	Daleth (Hebrew)
CHd	ℷ	Gimel (Hebrew)
CJb	<sc>B</sc>	B Bernoulli function
CJh	<sc>H</sc>	H Hamiltonian
CJl	<sc>L</sc>	L Lagrangian
CJm	<sc>M</sc>	M physics M-matrix
CJo	<sc>O</sc>	O order of
Pa0	<ac>&z.glst</ac><ac>&z.bar</ac>	glottal stop, barred (phonetic symbol)
Pa1	&z.glst;	glottal stop (phonetic symbol)
Pa2	&z.sbbrg;	subscript bridge (phonetic symbol)
Pa3	&z.lam;	laminal (phonetic symbol)
Pa5	&z.sbbrgt;	subscript bridge, turned (phonetic symbol)
Pa6	&z.aacute;	extra high, accent (phonetic symbol)
Pa7	&z.xhighs;	extra high, symbol (phonetic symbol)
Pa8	&z.ht;	hooktop (phonetic symbol)
Paa	&z.pa;	lower-case a (phonetic symbol)
Pab	b	lower-case b (phonetic symbol)
Pac	c	lower-case c (phonetic symbol)
Pad	d	lower-case d (phonetic symbol)
Pae	e	lower-case e (phonetic symbol)
Paf	f	lower-case f (phonetic symbol)
Pag	&z.pg;	lower-case 'script' g (phonetic symbol)
Pah	h	lower-case h (phonetic symbol)
Pai	i	lower-case i (phonetic symbol)
Paj	j	lower-case j (phonetic symbol)
Pak	k	lower-case k (phonetic symbol)
Pal	l	lower-case l (phonetic symbol)
Pam	m	lower-case m (phonetic symbol)
Pan	n	lower-case n (phonetic symbol)

Coordinate	Content	Description
Pao	o	lower-case o (phonetic symbol)
Pap	p	lower-case p (phonetic symbol)
Paq	q	lower-case q (phonetic symbol)
Par	r	lower-case r (phonetic symbol)
Pas	s	lower-case s (phonetic symbol)
Pat	t	lower-case t (phonetic symbol)
Pau	u	lower-case u (phonetic symbol)
Pav	v	lower-case v (phonetic symbol)
Paw	w	lower-case w (phonetic symbol)
Pax	x	lower-case x (phonetic symbol)
Pay	y	lower-case y (phonetic symbol)
Paz	z	lower-case z (phonetic symbol)
Pb0	<code><ac>&z.inglst;</ac><ac>&z.xl;</ac></code>	inverted glottal stop, crossed (phonetic symbol)
Pb1	<code>&z.inglst;</code>	inverted glottal stop (phonetic symbol)
Pb2	<code>&z.raisi;</code>	raising sign (phonetic symbol)
Pb3	<code>&z.trgull;</code>	seagull, turned (phonetic symbol)
Pb4	<code><ac>2</ac><ac>&z.xl;</ac></code>	crossed 2 (phonetic symbol)
Pb5	<code>&z.bar;</code>	bar (phonetic symbol)
Pb6	<code>&z.ggrave;</code>	extra low, accent (phonetic symbol)
Pb7	<code>&z.xlows;</code>	extra low, symbol (phonetic symbol)
Pb8	<code>&z.ctl;</code>	curly tail (phonetic symbol)
Pba	<code>&z.trna;</code>	turned a (phonetic symbol)
Pbb	<code><a><ac>b</ac><ac>&z.ht;</ac></code>	b hooktop (phonetic symbol)
Pbc	<code><a><ac>c</ac><ac>&caron;</ac></code>	c wedge (phonetic symbol)
Pbd	<code><a><ac>d</ac><ac>&z.ht;</ac></code>	d hooktop (phonetic symbol)
Pbe	<code>&z.schwa;</code>	schwa (phonetic symbol)
Pbg	<code><a><ac>&z.pg;</ac><ac>&z.ht;</ac></code>	g hooktop (phonetic symbol)
Pbh	<code><ac>h</ac><ac>&z.xl;</ac></code>	crossed h (phonetic symbol)
Pbi	<code><ac>i</ac><ac>&z.bar;</ac></code>	barred i (phonetic symbol)
Pbj	<code><a><ac>j</ac><ac>&caron;</ac></code>	j wedge (phonetic symbol)
Pbk	<code><a><ac>k</ac><ac>&z.ht;</ac></code>	k hooktop (phonetic symbol)
Pbl	<code><ac>l</ac><ac>&z.bar;</ac></code>	barred l (phonetic symbol)
Pbm	<code>&z.ltlmr;</code>	m with leftward tail at right (phonetic symbol)
Pbn	<code><a><ac>n</ac><ac>&tilde;</ac></code>	tilde n (phonetic symbol)

Coordinate	Content	Description
Pbo	⊙	bull's eye (phonetic symbol)
Pbp	þ	thorn (phonetic symbol)
Pbr	&z.fhr;	fish-hook r (phonetic symbol)
Pbs	<a><ac>s</ac><ac>ˇ</ac>	s wedge (phonetic symbol)
Pbt	<a><ac>t</ac><ac>&z.palhi</ac>	left-hook t (phonetic symbol)
Pbu	<ac>u</ac><ac>&z.bar;</ac>	barred u (phonetic symbol)
Pbv	&z.pscrv;	script v (phonetic symbol)
Pbw	&z.invw;	inverted w (phonetic symbol)
Pbx	χ	chi (phonetic symbol)
Pby	&z.trny;	turned y (phonetic symbol)
Pbz	<a><ac>z</ac><ac>ˇ</ac>	z wedge (phonetic symbol)
Pc0	<ac>&z.reglst;</ac><ac>&z.bar;</ac>	glottal stop reversed, barred (phonetic symbol)
Pc1	&z.reglst;	reversed glottal stop (phonetic symbol)
Pc2	&z.low;	lowering sign (phonetic symbol)
Pc3	&z.sbw;	subscript w (phonetic symbol)
Pc5	&z.xl;	cross, short horizontal line (phonetic symbol)
Pc6	&z.hris;	high rising, accent (phonetic symbol)
Pc7	&z.hriss;	high rising, symbol (phonetic symbol)
Pca	&z.pscra;	script a (phonetic symbol)
Pcb	&z.psmcb;	small capital B (phonetic symbol)
Pcc	<ac>c</ac><ac>¸</ac>	c cedilla (phonetic symbol)
Pcd	&z.rtdl;	right-tail d (phonetic symbol)
Pce	<a><ac>&z.schwa;</ac><ac>&z.rh;</ac>	right-hook schwa (phonetic symbol)
Pcg	&z.psmcg;	small capital G (phonetic symbol)
Pch	<a><ac>h</ac><ac>&z.ht;</ac>	h hooktop (phonetic symbol)
Pci	ι	iota (phonetic symbol)
Pcj	<ac>&jnodot;</ac><ac>&z.bar;</ac>	barred dotless j (phonetic symbol)
Pck	&z.trnk;	turned k (phonetic symbol)
Pcl	&z.btldl;	belted l (phonetic symbol)
Pcm	&z.trnm;	turned m (phonetic symbol)
Pcn	&z.ltl;n;	n with left tail at left (phonetic symbol)
Pco	<ac>o</ac><ac>&z.bar;</ac>	barred o (phonetic symbol)
Pcp	Þ	THORN (phonetic symbol)
Pcr	&z.rl;	r with long leg (phonetic symbol)
Pcs	&z.rtls;	s with right tail (phonetic symbol)
Pct	&z.rtl;t;	t with right tail (phonetic symbol)

Coordinate	Content	Description
Pcu	&z.pupsil;	upsilon (phonetic symbol)
Pcy	&z.psmcy;	small capital Y (phonetic symbol)
Pcz	<ac>z</ac><ac>&z.ctl;</ac>	curly-tail z (phonetic symbol)
Pd1	!	exclamation point (phonetic symbol)
Pd2	&z.verts;	vertical stroke (superior) (phonetic symbol)
Pd3	&z.hbar;	horizontal bar (phonetic symbol)
Pd6	&z.lris;	low rising, accent (phonetic symbol)
Pd7	&z.lriss;	low rising, symbol (phonetic symbol)
Pda	&z.trnsa;	turned script a (phonetic symbol)
Pdb	β	beta (phonetic symbol)
Pdc	<ac>c</ac><ac>&z.ctl;</ac>	curly-tail c (phonetic symbol)
Pdd	&z.dyogh;	d-Yogh ligature (phonetic symbol)
Pde	&z.reve;	reversed e (phonetic symbol)
Pdg	&z.pgamm;	gamma (phonetic symbol)
Pdh	<a><ac>&z.heng;</ac><ac>&z.ht;</ac>	heng hooktop (phonetic symbol)
Pdi	&z.psmci;	small capital I (phonetic symbol)
Pdj	<ac><a><ac>&jnodot;</ac><ac>&z.ht;</ac></ac><ac>&z.bar;</ac>	dotless j, bar hooktop (phonetic symbol)
Pdk	&z.resmck;	small capital K, reversed (phonetic symbol)
Pdl	&z.rttl;	l with right tail (phonetic symbol)
Pdm	&z.trnmlr;	turned m with long right leg (phonetic symbol)
Pdn	&z.eng;	eng (phonetic symbol)
Pdo	ø	slashed o (phonetic symbol)
Pdp	<a><ac>p</ac><ac>&z.ht;</ac>	p hooktop (phonetic symbol)
Pdr	&z.rtlr;	r with right tail (phonetic symbol)
Pds	&z.esh;	esh (phonetic symbol)
Pdt	&z.tesh;	t-esh ligature (phonetic symbol)
Pdu	&z.psmcu;	small capital U (phonetic symbol)
Pdz	&z.rtlz;	z with right tail (phonetic symbol)
Pe1	—	pipe (phonetic symbol)
Pe2	&z.verti;	vertical stroke (inferior) (phonetic symbol)
Pe3	&z.gull;	seagull (phonetic symbol)
Pe6	&z.risfla;	rising-falling, accent (phonetic symbol)
Pe7	&z.risfls;	rising-falling, symbol (phonetic symbol)
Pea	æ	ash (phonetic symbol)
Peb	<ac>b</ac><ac>&z.xl;</ac>	crossed b (phonetic symbol)
Pec	∁	stretched c (phonetic symbol)
Ped	ð	eth (phonetic symbol)
Pee	&z.psmce;	small capital E (phonetic symbol)
Peg	&z.pbgam;	baby gamma (phonetic symbol)
Peh	&z.trnh;	turned h (phonetic symbol)

Coordinate	Content	Description
Pei	ı	i, undotted (phonetic symbol)
Pej	<ac>j</ac><ac>&z.ctl;</ac>	curly-tail j (phonetic symbol)
Pel	&z.lyogh;	l-Yogh ligature (phonetic symbol)
Pem	M	capital M (phonetic symbol)
Pen	&z.rtl;n;	n with right tail (phonetic symbol)
Peo	œ	o-e ligature (phonetic symbol)
Pep	&z.pphi;	phi (phonetic symbol)
Per	&z.trnr;	turned r (phonetic symbol)
Pes	<ac>&z.esh;</ac><ac>&z.ctl;</ac>	curly-tail esh (phonetic symbol)
Pet	&z.trnt;	turned t (phonetic symbol)
Pez	&z.yogh;	yogh (phonetic symbol)
Pf1	/	slash (phonetic symbol)
Pf2	&z.syllab;	syllabicity mark (phonetic symbol)
Pf3	&z.atr;	advanced tongue root (phonetic symbol)
Pf7	&z.highs;	high, symbol (phonetic symbol)
Pfa	&z.psmca;	small capital A (phonetic symbol)
Pfc	<a><ac>c</ac><ac>&z.ht;</ac>	c hooktop (phonetic symbol)
Pfd	Ð	ETH (phonetic symbol)
Pfe	ϵ	epsilon (phonetic symbol)
Pfg	<a><ac>G</ac><ac>&z.ht;</ac>	G small cap hooktop (phonetic symbol)
Pfh	&z.pcaph;	capital H (phonetic symbol)
Pfj	&jnodot;	j, undotted (phonetic symbol)
Pfl	L	capital L (phonetic symbol)
Pfn	&z.psmcn;	small capital N (phonetic symbol)
Pfo	Œ	small capital O-E ligature (phonetic symbol)
Pfr	&z.rtrtrnr;	turned r with right tail (phonetic symbol)
Pfs	&z.reshtl;	esh reversed, top loop (phonetic symbol)
Pft	θ	theta (phonetic symbol)
Pfz	<ac>&z.yogh;</ac><ac>&z.ctl;</ac>	curly-tail yogh (phonetic symbol)
Pg1	&z.Barpip;	double-barred pipe (phonetic symbol)
Pg2	⌝	corner (phonetic symbol)
Pg3	&z.rtr;	retracted tongue root (phonetic symbol)
Pg7	&z.mids;	mid, symbol (phonetic symbol)
Pga	&z.invv;	inverted v (phonetic symbol)
Pgd	<ac>d</ac><ac>&z.xl;</ac>	crossed d (phonetic symbol)
Pge	&z.reveps;	reversed epsilon (phonetic symbol)
Pgh	&z.hrttrh;	turned h, hook right tail (phonetic symbol)
Pgl	&lambd;	lambda (phonetic symbol)
Pgn	&z.nlr;	n, long right leg (phonetic symbol)
Pgo	&z.openo;	open o (phonetic symbol)

Coordinate	Content	Description
Pgr	&z.trnrl;	turned longlegged r (phonetic symbol)
Pgt	<a><ac>t</ac><ac>&z.ht</ac>	t hooktop (phonetic symbol)
Pgz	&z.btyogh;	yogh, bent tail (phonetic symbol)
Ph1	≠	double-barred slash (phonetic symbol)
Ph2	&z.hlmrk;	half-length mark (phonetic symbol)
Ph7	&z.lows;	low, symbol (phonetic symbol)
Pha	<a><ac>&z.pscra</ac><ac>&z.rh</ac>	script a, right hook (phonetic symbol)
Phd	<ac>D</ac><ac>&z.xl</ac>	crossed D (phonetic symbol)
Phe	<a><ac>&z.reveps</ac><ac>&z.rh</ac>	right hook reversed epsilon (phonetic symbol)
Phh	&z.hvlig;	h-v ligature (phonetic symbol)
Phl	<ac>&lambd</ac><ac>&z.xl</ac>	lambda, crossed (phonetic symbol)
Phn	<ac>n</ac><ac>&z.ctl</ac>	curly-tail n (phonetic symbol)
Pho	ω	lower-case omega (phonetic symbol)
Phr	&z.psmcr;	small capital R (phonetic symbol)
Pht	<ac>t</ac><ac>&z.ctl</ac>	curly-tail t (phonetic symbol)
Pi1	∥	double Pipe (phonetic symbol)
Pi2	&z.lmrk;	length mark (phonetic symbol)
Pi7	&z.riss;	rising, symbol (phonetic symbol)
Pid	<ac>d</ac><ac>&z.ctl</ac>	curly-tail d (phonetic symbol)
Pie	&z.creps;	closed reversed epsilon (phonetic symbol)
Pih	&z.heng;	heng (phonetic symbol)
Pio	&z.clomeg;	closed omega (phonetic symbol)
Pir	&z.invr;	inverted small capital R (phonetic symbol)
Pj1	&z.pSlash;	double Slash (phonetic symbol)
Pj2	’	apostrophe (phonetic symbol)
Pj7	&z.fals;	falling, symbol (phonetic symbol)
Pje	<a><ac>&epsiv</ac><ac>&z.rh</ac>	epsilon, upper right hook (phonetic symbol)
Pjo	<a><ac>&z.openo</ac><ac>&z.rh</ac>	open o, upper right hook (phonetic symbol)
Pjr	&z.refhr;	fish-hook r, reversed (phonetic symbol)
Pk1	&z.trisla;	triple Slash (phonetic symbol)
Pk2	&z.reapos;	reversed apostrophe (phonetic symbol)
Pko	&z.trnomeg;	inverted omega (phonetic symbol)
Pkr	&z.rtrfhr;	reversed fish-hook r, right tail (phonetic symbol)
Pl1	&z.sbs;	small backslash (phonetic symbol)
Pl2	‘	turned comma (phonetic symbol)
Plr	&z.refhrl;	reversed fish-hook r, long leg (phonetic symbol)

Coordinate	Content	Description
Pm2	&z.sblhr;	left half-ring (phonetic symbol)
Pn2	&z.sbrhr;	right half-ring (phonetic symbol)
Po2	&z.palh;	palatization hook (phonetic symbol)
Pp2	&z.rh;	right hook (phonetic symbol)
Pq2	&z.rndcap;	round cap (phonetic symbol)
Pq3	&z.mdc;	mid centralized (phonetic symbol)
Pr2	&z.archs;	subscript arch (phonetic symbol)
Ps2	&z.toplig;	top ligature (phonetic symbol)
Pt2	&z.btmlig;	bottom ligature (phonetic symbol)

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- [12] Elsevier Science Copyright Policies, September 1995.

Index

- <a>, accent construction, 48
- <abbreviations>, list of abbreviations, 33
- <abs>, abstract, 15
- abstract, <abs>, 15
- abstract type, class, 15
- <ac>, accent, accented character, 48
- academic or other degrees, <degs>, 13
- <acc>, accepted date, 15
- accent construction, <a>, 48
- accent, accented character, <ac>, 48
- accepted date, <acc>, 15
- <ack>, acknowledgement, 17
- acknowledgement, <ack>, 17
- <aff>, affiliation, 14
- affiliation, <aff>, 14
- aid, article identifier, 7
- align, fraction alignment, 50
- <app>, appendix, 18
- appendix, <app>, 18
- appendix matter, <appm>, 18
- <appm>, appendix matter, 18
- <ar>, array, 50
- arrange, superior/inferior arrangement, 47
- array, <ar>, 50
- arrow, <arrow>, 51
- <arrow>, arrow, 51
- <art>, article, 7
- article, <art>, 7
- article body, <bdy>, 16
- article identifier, aid, 7
- article title, <atl>, 10
- <atl>, article title, 10
- <atl>, title footnote, 10
- <au>, author, 12
- <aug>, author group, 12
- author, <au>, 12
- <author>, author in bibliographic reference, 20
- author group, <aug>, 12
- author group in bibliographic reference, <authors>, 19
- author in bibliographic reference, <author>, 20
- <authors>, author group in bibliographic reference, 19

- , bold, 51
- back matter, <bm>, 17
- <bb>, reference to article or similar publication, 19
- <bdy>, article body, 16
- <bib>, bibliographic reference, 18
- <bibl>, bibliographic list, 18
- bibliographic list, <bibl>, 18
- bibliographic reference, <bib>, 18
- biographic information, <vt>, 30
- <bm>, back matter, 17
- bold, , 51
- <book>, book in bibliographic reference, 22
- book in bibliographic reference, <book>, 22
- book series in bibliographic reference, <book-series>, 22
- <book-series>, book series in bibliographic reference, 22
- bottom-stubs, row stubs, 42
- box, <box>, 48
- <box>, box, 48

- <c>, cell, 42
- ca, column alignment, 43, 50
- <caff>, collaboration affiliation, 12
- caption, <caption>, 43, 46
- <caption>, caption, 43, 46
- cell, <c>, 42
- center-post style, style, 49
- center-post type, type, 49
- city, <cty>, 14
- class, abstract type, 15
- class, keyword type, 15
- <cny>, country, 14
- cny-code, country code, 14
- <collab>, collaboration, 12
- collaboration, <collab>, 12
- collaboration affiliation, <caff>, 12
- column alignment, ca, 43, 50
- column alignment, cs, 50
- column span, cspan, 43
- column stubs, left-stubs, 42
- column stubs, right-stubs, 42
- <comment>, comment in bibliographic reference, 20
- comment in bibliographic reference, <comment>, 20
- <conference>, conference in bibliographic reference, 21
- conference in bibliographic reference, <conference>, 21
- <contribution>, contribution, independent text or other object, 19
- contribution, independent text or other object, <contribution>, 19
- <copyright>, copyright information, 7
- copyright information, <copyright>, 7

- copyright year, *yr*, 7
- <cor>, correspondence address, 12, 14
- correspondence address, <cor>, 12, 14
- country, <cn>, 14
- country code, *cn*-code, 14
- <cp>, fence post, 49
- <cross-ref>, cross-reference, 39
- cross-reference, <cross-ref>, 39
- cross-reference identifier, *id*, 14, 42, 47
- cross-reference identifier(s), *refid*, 39
- cs, column alignment, 50
- cspan, column span, 43
- <cty>, city, 14
- <date >, date in bibliographic reference, 21
- date in bibliographic reference, <date >, 21
- day, *day*, 15
- day, *day*, 15
- <de>, denominator, 50
- <ded>, dedication, 10
- dedication, <ded>, 10
- definition list, <dl>, 42
- <degs>, academic or other degrees, 13
- denominator, <de>, 50
- displayed formula, <fd>, 47
- displayed quotation, <qd>, 39
- <dl>, definition list, 42
- <dochead>, document header, 9
- docsubty, document subtype, 7
- <doctopic>, document topic, 9
- document header, <dochead>, 9
- document subtype, *docsubty*, 7
- document topic, <doctopic>, 9
- <e-host>, electronic host in bibliographic reference, 23
- <ead>, electronic-mail address, 14
- edited book in bibliographic reference, <edited-book>, 22
- <edited-book>, edited book in bibliographic reference, 22
- <editor>, editor in bibliographic reference, 21
- editor group in bibliographic reference, <editors>, 21
- editor in bibliographic reference, <editor>, 21
- <editors>, editor group in bibliographic reference, 21
- electronic host in bibliographic reference, <e-host>, 23
- electronic-mail address, <ead>, 14
- end overline, <ovr>, 48
- end underline, <unr>, 48
- <enun>, enunciation, 39
- enunciation, <enun>, 39
- <et-al>, indicator for et al., 20
- external filename, *file*, 40
- <f>, inline formula, 47
- <fd>, displayed formula, 47
- <fen>, fence, 49
- fence, <fen>, 49
- fence post, <cp>, 49
- <fig>, figure, 45, 46
- figure, <fig>, 45, 46
- file, external filename, 40
- first name, <fnm>, 12
- first page in bibliographic reference, <first-page>, 22
- <first-page>, first page in bibliographic reference, 22
- float location, *loc*, 42, 45
- <fm>, front matter, 9
- <fn>, footnote, 38, 39
- <fnm>, first name, 12
- footnote, <fn>, 38, 39
- <fr>, fraction, 50
- fraction, <fr>, 50
- fraction alignment, *align*, 50
- fraction bar style, *style*, 50
- fraction shape, *shape*, 50
- front matter, <fm>, 9
- <further-reading>, further-reading list, 29
- further-reading list, <further-reading>, 29
- <ge>, german, 51
- german, <ge>, 51
- glossary, <glossary>, 29, 36
- <glossary>, glossary, 29, 36
- glossary definition, <glossary-def>, 29
- glossary definition, <glossary-definition>, 36
- glossary entry, <glossary-entry>, 29, 36
- glossary heading, <glossary-heading>, 29, 36
- <glossary-def>, glossary definition, 29
- <glossary-definition>, glossary definition, 36
- <glossary-entry>, glossary entry, 29, 36
- <glossary-heading>, glossary heading, 29, 36
- horizontal space, <hsp>, 51
- <host>, host in bibliographic reference, 20
- host in bibliographic reference, <host>, 20
- <hsp>, horizontal space, 51
- id*, cross-reference identifier, 14, 42, 47
- index, <index>, 32
- <index>, index key, 13
- <index>, index, 32
- index entry, <index-entry>, 33
- index heading, <index-heading>, 33
- index key, <index>, 13
- <index-entry>, index entry, 33
- <index-heading>, index heading, 33
- <indexer>, name of indexer, 32
- indicator for et al., <et-al>, 20
- <inf>, inferior, 47
- inferior, <inf>, 47
- initials, <inits>, 13

- <inits>, initials, 13
- inline formula, <f>, 47
- inter-document reference, <inter-ref>, 40
- <inter-ref>, inter-document reference, 40
- intra-document reference, <intra-ref>, 40
- <intra-ref>, intra-document reference, 40
- <issue>, issue in bibliographic reference, 20
- issue in bibliographic reference, <issue>, 20
- issue number in bibliographic reference,
 - <issue-nr>, 21
- <issue-nr>, issue number in bibliographic reference, 21
- <it>, italic, 51
- italic, <it>, 51

- jid, journal identifier, 7
- journal identifier, jid, 7
- <jr>, name suffix, 13

- keyword, <kwd>, 16
- keyword group, <kwdg>, 15
- keyword type, class, 15
- <kwd>, keyword, 16
- <kwdg>, keyword group, 15

- <l>, list, 41
- language, language of abstract, 15
- language, language of article title, 10
- language, language of article, 7, 15
- language, language of keyword group, 15
- language, language of title in bibliographic reference, 20
- language of abstract, language, 15
- language of article, language, 7, 15
- language of article title, language, 10
- language of keyword group, language, 15
- language of title in bibliographic reference,
 - language, 20
- last page in bibliographic reference, <last-page>, 22
- <last-page>, last page in bibliographic reference, 22
- left-stubs, column stubs, 42
- , list item, 41
- <lim>, limit construction, 49
- limit construction, <lim>, 49
- <link>, link to local external entity, 40
- link to local external entity, <link>, 40
- list, <l>, 41
- list item, , 41
- list of abbreviations, <abbreviations>, 33
- list type, type, 41
- <ll>, lower limit, 49
- loc, float location, 42, 45
- loc, superior/inferior position, 47
- <location>, publisher location in bibliographic reference, 22
- location reference, <locr>, 33
- locator, type of electronic publication, 23
- <locr>, location reference, 33
- lower limit, <ll>, 49

- <misc>, miscellaneous history information, 15
- miscellaneous history information, <misc>, 15
- mo, month, 15
- month, mo, 15

- <name>, publisher name in bibliographic reference, 22
- name of indexer, <indexer>, 32
- name suffix, <jr>, 13
- <no>, number, 14
- nomenclature, <nomenclature>, 16
- <nomenclature>, nomenclature, 16
- <nu>, numerator, 50
- number, <no>, 14
- numerator, <nu>, 50

- <of>, openface, 51
- <op>, operator, 49
- openface, <of>, 51
- operator, <op>, 49
- ornament style, style, 48
- ornament type, type, 48
- other type of bibliographic reference, <other-ref>, 23
- <other-ref>, other type of bibliographic reference, 23
- <ov>, start overline, 48
- overline, <ovl>, 48
- <ovl>, overline, 48
- <ovr>, end overline, 48

- <p>, paragraph, 15
- page range in bibliographic reference, <pages>, 21
- <pages>, page range in bibliographic reference, 21
- paragraph, <p>, 15
- parent document, refers-to, 7
- Pii, pii, 7
- pii, Pii, 7
- presented by, <prs>, 10
- <prs>, presented by, 10
- <publisher>, publisher in bibliographic reference, 22
- publisher in bibliographic reference, <publisher>, 22
- publisher location in bibliographic reference,
 - <location>, 22
- publisher name in bibliographic reference, <name>, 22

- <qd>, displayed quotation, 39

- <r>, row, 42
- rôles and job-titles, <roles>, 13
- ra, row alignment, 43, 50

- <rad>, radical, 50
- radical, <rad>, 50
- radicand, <rdd>, 50
- radix, <rdx>, 50
- <rdd>, radicand, 50
- <rdx>, radix, 50
- <re>, received date, 15
- received date, <re>, 15
- reference to article or similar publication, <bb>, 19
- refers-to, parent document, 7
- refid, cross-reference identifier(s), 39
- revised date, <rv>, 15
- right-stubs, column stubs, 42
- <rm>, roman, 51
- <roles>, rôles and job-titles, 13
- roman, <rm>, 51
- row, <r>, 42
- row alignment, ra, 43, 50
- row alignment, rs, 50
- row span, rspan, 43
- row stubs, bottom-stubs, 42
- row stubs, top-stubs, 42
- rs, row alignment, 50
- rspan, row span, 43
- <rv>, revised date, 15

- Salutation, <salutation>, 16
- <salutation>, Salutation, 16
- sans serif, <ssf>, 51
- <sbt>, sub-title, 10
- <sc>, script, 51
- <scp>, small caps, 51
- script, <sc>, 51
- <sec>, section, 16
- section, <sec>, 16
- section title, <st>, 17
- <series>, series in bibliographic reference, 21
- series in bibliographic reference, <series>, 21
- shape, fraction shape, 50
- size of space, sp, 51
- small caps, <scp>, 51
- <snm>, surname, 13
- sp, size of space, 51
- <ssf>, sans serif, 51
- <st>, section title, 17
- start overline, <ov>, 48
- start underline, <un>, 48
- style, center-post style, 49
- style, fraction bar style, 50
- style, ornament style, 48
- sub-title, <sbt>, 10
- <sup>, superior, 47
- superior, <sup>, 47
- superior/inferior arrangement, arrange, 47
- superior/inferior position, loc, 47
- surname, <snm>, 13

- table, <tbl>, 42
- table body, <tblbdy>, 42, 43
- table footnote, <tblfn>, 43
- <tbl>, table, 42
- <tblbdy>, table body, 42, 43
- <tblfn>, table footnote, 43
- text-box, <textbox>, 46
- <textbox>, text-box, 46
- <title>, title inliographic reference, 20
- <title>, title of index, 32
- title footnote, <at1>, 10
- title inliographic reference, <title>, 20
- title of index, <title>, 32
- top-stubs, row stubs, 42
- translated title in bibliographic reference, <translated-title>, 20
- <translated-title>, translated title in bibliographic reference, 20
- <ty>, typewriter, 51
- type, center-post type, 49
- type, list type, 41
- type, ornament type, 48
- type of electronic publication, locator, 23
- typewriter, <ty>, 51

- , upper limit, 49
- <un>, start underline, 48
- underline, <unl>, 48
- <unl>, underline, 48
- unprinted item, <upi>, 46
- <unr>, end underline, 48
- <upi>, unprinted item, 46
- upper limit, , 49

- valign, vertical alignment, 48
- version, version, 7
- version, version, 7
- vertical alignment, <vmk>, 43
- vertical alignment, valign, 48
- vertical space, <vsp>, 51
- <vmk>, vertical alignment, 43
- volume number in bibliographic reference, <volume-nr>, 21
- <volume-nr>, volume number in bibliographic reference, 21
- <vsp>, vertical space, 51
- <vt>, biographic information, 30

- year, yr, 15
- yr, copyright year, 7
- yr, year, 15