

CHEMNUM

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CHEMNUM revisited

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Table of Contents

1	License and Requirements	1	6	Overview over the Available Options	10
2	News	2	7	The Counter Settings	12
3	Overview over the Available Commands	2	7.1	Change the Numbering	12
			7.2	Reset the Numbering	14
4	Numbering Compounds	4	8	Formatting Labels	14
4.1	Main Command	4	9	Replacing Tags in EPS or PS Files	15
4.2	Sublabel	5	10	Changing the Input Markers	18
4.3	Lists	6	11	Language Dependent Settings	19
4.4	Lists and Ranges of Sublabels .	6	12	Debugging Information	19
4.5	Usage in Section Headings and Captions	7	References		21
5	Details on Compound Labels	7	Index		23
5.1	How Things Work	7			
5.2	Properties of Compound Labels	8			
5.3	Initiating Labels	9			

1 License and Requirements

Permission is granted to copy, distribute and/or modify this software under the terms of the L^AT_EX Project Public License (LPPL), version 1.3 or later (<http://www.latex-project.org/lppl.txt>). The software has the status “maintained.”

CHEMNUM requires the bundles l3kernel [The13a] and l3packages [The13b]. It also requires the translations package [Nie13b] and chemgreek from the chemmacros bundle [Nie13a]. It also loads the psfrag [GC98].

2 News

The **CHEMNUM** package has been my first attempt to create a comprehensive labeling package for chemical compounds. However, it had and has more than one weakness and its code was – to be frank – a mess. Version 1 is now a complete re-write of **CHEMNUM** where I tried to achieve several points:

- A cleaner code internally.
- A cleaner user interface, *i. e.*, more user macros for different tasks, a unified naming of the commands and a less redundant naming of the options.
- Extended functionality such as sorting and compressing of sublabel lists.

Although the syntax seems more or less the same at first sight quite some changes have been made that make version 1 incompatible with version 0. This is why version 0 is still available through the option `version = {0}`. If you load the package with

```
\usepackage[version=0]{chemnum}
```

version 0.6b from June 5th 2013 will be used. This version is not documented in the document you're reading right now. Older manuals are still available from websites such as ctanhg.scharrer-online.de or bitbucket.org/cgnieder/chemnum. You can also email me for an older manual.

Many commands have got a new name! The most important ones are:

- `\cmpdref`; this is now called `\replacecmpd`.
- `\cmpdinit`; this is now called `\initcmpd`.
- `\cmpdsetup`; this is now called `\setchemnum`.

However, there are many more changes. Basically all options have new names and often do their thing slightly different from the way things have been before.

Please note that this overall change does not mean that version 1 is version 0 declared stable. It is very likely that version 1 will now have quite a number of bugs to be fixed and probably missing features, too. So I'd be very glad to receive feedback either on **CHEMNUM**'s homepage bitbucket.org/cgnieder/chemnum or via email to contact@mychemistry.eu.

3 Overview over the Available Commands

`\cmpd*[<options>]{<list of IDs>}`

The main command for creating and referring to compound labels. This command is described in detail in section 5.

`\refcmpd[$\langle options \rangle$]{ $\langle ID \rangle$ }`

This command only refers to a already defined label but does not define a label itself. This is an alias of `\cmpd+`.

`\labelcmpd[$\langle options \rangle$]{ $\langle ID \rangle$ }`

This command only defines a new label but does not print it. This is an alias of `\cmpd*`.

* `\cmpdplain{ $\langle ID \rangle$ }`

Reads a label and writes it expandably without formatting. It is not able to parse a list. Its sole purpose is usage in pdfstrings (cf. `\texorpdfstring{ $\langle T_{\text{EX}} \rangle$ }{ $\langle pdfstring \rangle$ }`). This command is described in section 5.

* `\subcmpdplain{ $\langle main ID \rangle$ }{ $\langle sub ID \rangle$ }`

Reads a sublabel and writes it expandably without formatting. It is not able to parse a list. Its sole purpose is usage in pdfstrings (cf. `\texorpdfstring{ $\langle T_{\text{EX}} \rangle$ }{ $\langle pdfstring \rangle$ }`). This command is described in section 5.

* `\submaincmpdplain{ $\langle main ID \rangle$ }{ $\langle sub ID \rangle$ }`

Reads a main and a sublabel and writes them expandably without formatting. It is not able to parse a list. Its sole purpose is usage in pdfstrings (cf. `\texorpdfstring{ $\langle T_{\text{EX}} \rangle$ }{ $\langle pdfstring \rangle$ }`). This command is described in section 5.

`\initcmpd[$\langle options \rangle$]{ $\langle list of IDs \rangle$ }`

Initiate compound labels. This command can only be used in the preamble. It is described in section 5.

* `\cmpdproperty{ $\langle ID \rangle$ }{ $\langle property \rangle$ }`

Get the associated property $\langle property \rangle$ of compound $\langle ID \rangle$. This command is described in detail in section 5.

* `\subcmpdproperty{ $\langle main ID \rangle$ }{ $\langle sub ID \rangle$ }{ $\langle property \rangle$ }`

Get the associated property $\langle property \rangle$ of subcompound $\langle sub ID \rangle$ of compound $\langle main ID \rangle$. This command is described in detail in section 5.

`\newcmpdcounterformat{ $\langle name \rangle$ }{ $\langle command \rangle$ }`

Makes the label format $\langle name \rangle$ known to `CHEMNUM`. $\langle command \rangle$ needs to be a command that takes an integer number as argument and should return a formatted version of it. In practice you should not need to use this command as the most common formats already are defined. This command is described in section 7.1.

`\resetcmpd[$\langle integer \rangle$]`

Default: 1

Reset the numbering for main compound labels to start with $\langle integer \rangle$ again. This is the same as `\setcounter{cmpdmain}{ $\langle integer \rangle$ - 1}`. The command is described in section 7.2.

`\cmpdshowdef{ $\langle ID \rangle$ }`

Internal command used to display $\langle ID \rangle$ of a newly defined compound label when the option `show-keys` is used. The command is described in section 12.

`\cmpdshowref{⟨ID⟩}`

Internal command used to display $\langle ID \rangle$ of a referencing compound label when the option `show-keys` is used. The command is described in section 12.

`\subcmpdshowdef{⟨main ID⟩}{⟨sub ID⟩}`

Internal command used to display $\langle main ID \rangle$ and $\langle sub ID \rangle$ of a newly defined subcompound label when the option `show-keys` is used. The command is described in section 12.

`\subcmpdshowref{⟨main ID⟩}{⟨sub ID⟩}`

Internal command used to display $\langle main ID \rangle$ and $\langle sub ID \rangle$ of a referencing subcompound label when the option `show-keys` is used. The command is described in section 12.

4 Numbering Compounds

4.1 Main Command

The main command of this package is this one:

`\cmpd{⟨ID⟩}`

When $\langle compound name \rangle$ is used the first time, the label is created, saved (= declared) and printed. Each further use just prints the label.

1 Compounds `\cmpd{a}` and `\cmpd{b}` are declared and can be used any time:
2 `\cmpd{a}`. No pre-declaring is necessary. Compounds like `\cmpd{c}` are
3 numbered in the order they appear in the text. `\par`
4 Once again: `\cmpd{b}`, `\cmpd{a}`, `\cmpd{c}`.

Compounds **1** and **2** are declared and can be used any time: **1**. No pre-declaring is necessary. Compounds like **3** are numbered in the order they appear in the text.

Once again: **2**, **1**, **3**.

If it is necessary to declare a compound without printing the label it is possible with

`\cmpd*{⟨ID⟩}`

Declare the label but don't print anything.

1 The hidden version `\cmpd*{d}` declares the label but doesn't print anything.
2 The next `\cmpd{e}` continues to count with the next number. With `\cmpd{d}`
3 the label can be used, of course.

The hidden version declares the label but doesn't print anything. The next **5** continues to count with the next number. With **4** the label can be used, of course.

You can pretty much use what you like for a label name except for the separator symbols (see section 10). Be careful with blanks though! Leading and trailing spaces are ignored, spaces at other places are not. It's probably best not to use blanks in label names at all.

```
1 \cmpd{aa}, \cmpd{aa_}, \cmpd{ _aa}, and \cmpd{ _aa_} all have the same label.
2 Likewise \cmpd{a_a}, \cmpd{a_a_}, \cmpd{ _a_a}, \cmpd{ _a_a_}, \cmpd{a__a},
3 \cmpd{a__a_}, \cmpd{ _a__a}, and \cmpd{ _a__a_}.
```

6, 6, 6, and 6 all have the same label. Likewise **7, 7, 7, 7, 7, 7, 7, and 7**.

4.2 Sublabel

If you want a label like **1a**, you need to use the following syntax:

```
\cmpd{⟨main ID⟩.⟨sub ID⟩}
```

⟨main ID⟩ is the main name which stays the same, ⟨sub ID⟩ varies. This syntax means that the point `.` cannot be a part of ⟨main ID⟩ or ⟨sub ID⟩. Instead of the point you also can use another symbol, see section 10.

```
1 \cmpd{f.one} and \cmpd{f.two} are related, as are \cmpd{g.one} and
2 \cmpd{g.two}. Of course these labels can be used again: \cmpd{g.two} and
3 \cmpd{f.one}.
```

8a and **8b** are related, as are **9a** and **9b**. Of course these labels can be used again: **9b** and **8a**.

This also works if the main name has already been used.

```
1 \cmpd{a} and its variants \cmpd{a.one} and \cmpd{a.two}
```

1 and its variants **1a** and **1b**

The same way the main name of combined labels can be used solely.

```
1 \cmpd{f} and \cmpd{g}
```

8 and 9

How you can create a label like **8a,b** is explained in section 4.4.

4.3 Lists

There is actually more to the `\cmpd` command. It also prints lists of labels. The right description would be something like:

`\cmpd{((possibly comma separated list of) label name(s))}`

Treats each entry of the list as described before.

This means that with default settings the comma can't be part of the label name unless hidden in braces. As separator can be used another symbol, too, see section 10.

1 More than one label can be put inside `\cs{cmpd}`, separated by commas. Then
 2 a list like `\cmpd{a, b, c, e, g.two}` is printed.

More than one label can be put inside `\cmpd`, separated by commas. Then a list like **1, 2, 3, 5, and 9b** is printed.

The Harvard comma (see section 11) in **1, 2, 3, 5, and 9b** suggests that there are options to customize the list, see section 8.

4.4 Lists and Ranges of Sublabels

Sometimes it can be useful to display a label with a list or a range of sublabels. Suppose you have compounds **10a**, **10b**, **10c**, **10d**, and **10e** which for example differ in their substituents. It can be useful to refer to them all at once:

The syntax is rather intuitive – you just input a list of sublabels:

```
1 \setchemnum{compress=false}%
2 list of labels: \cmpd{q.one, q.two, q.three, q.four, q.five}\par
3 label with list of sublabels: \cmpd{q.{one,two,three,four,five}}
```

list of labels: **10a, 10b, 10c, 10d, and 10e**

label with list of sublabels: **10a,b,c,d,e**

Since the sublist is input with a comma in the default setting, you have to put them into braces. If you add a list of sublabels to a main label they will always be printed in the order the sublabels have been declared and not in the order they're input in the list:

```
1 \setchemnum{compress=false}%
2 compare \cmpd{q.{one,two,three,four,five}}
3 with \cmpd{q.{five,four,three,two,one}} and
4 \cmpd{q.{three,four,one,five,two}}
```

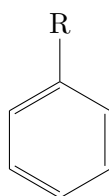
compare **10a,b,c,d,e** with **10a,b,c,d,e** and **10a,b,c,d,e**

Using this syntax you also can create ranges of sublabels. For this you enable the option **compress**. Or rather: this is the default setting. If you don't want compressed sublabels you have to disable the option like in the previous example.

```
1 \cmpd{q.{two,four,three}} \par 10b-d
2 \cmpd{q.{five,one,three,four}} \par 10a,c-e
3 \cmpd{q.{one,three,five,two}}
```

Obviously you can't use a comma as part of a sublabel name. You can change the input marker, though. See section 6 for available options.

```
1 % uses packages 'chemfig', 'chemformula' and 'booktabs'
2 \setatomsep{2em}%
3 \chemname{\chemfig{*6(==(-R)-)}}{\cmpd{benzene.{H,Me,OH,NH2}}}%
4 \begin{tabular}{lll}
5 & & & & \ch{-R} & & Name \\
6 \cmpd[sub-only]{benzene.H} & & \ch{-H} & & Benzene \\
7 \cmpd[sub-only]{benzene.Me} & & \ch{-CH3} & & Toluene \\
8 \cmpd[sub-only]{benzene.OH} & & \ch{-OH} & & Phenol \\
9 \cmpd[sub-only]{benzene.NH2} & & \ch{-NH2} & & Phenylamine (Aniline)
10 \end{tabular}
```

 11a-d			
		—R	Name
	a	—H	Benzene
	b	—CH ₃	Toluene
	c	—OH	Phenol
	d	—NH ₂	Phenylamine (Aniline)

4.5 Usage in Section Headings and Captions

If you use labels in section headings or captions you will want to use either `\refcmpd` or `\cmpd+` (they are completely equivalent). Otherwise the corresponding labels will be declared when the section headings appear in the table of contents or maybe the page header. This would mess up the desired order of the compound numbers.

5 Details on Compound Labels

5.1 How Things Work

When you call `\cmpd` with a new label three things happen:

- The new label gets initiated. This is nothing more than adding it to an internal list. The purpose of this is explained in section 5.3.
- The new label gets declared. This means that a number of internal commands are defined. Amongst other things they hold a number of properties associated with the corresponding label. Those properties are explained in more detail in section 5.2. The necessary information of the label are also written to the aux file.
- The label gets printed.

Since new labels are declared when `\cmpd` is first used using it in section titles that are written to the table of contents may lead to wrong numbering. In order to avoid this compound label information is written to the aux file. The command `\refcmpd[⟨options⟩]{⟨ID⟩}` only reads those information but does not declare a label. There is also a command which does the opposite: it declares a label if it hasn't been declared before but will not print the corresponding label: `\labelcmpd[⟨options⟩]{⟨ID⟩}`.

Both commands have shortcut versions: `\cmpd+` is the same as `\refcmpd`, `\cmpd*` is the same as `\labelcmpd`.

Another command available is `\cmpdplain{⟨ID⟩}`. This command is similar to `\refcmpd`. There are a few important differences, though: `\cmpdplain` does *not* take a list of labels as argument. It also is *not* able to interpret sublabels. `\cmpdplain` does not format the label with whatever format has been declared. And last but not least: it is expandable. This means it can be used to get labels in portable document format (PDF) bookmarks. It's equivalent `\subcmpdplain{⟨main ID⟩}{⟨sub ID⟩}` does the same for sublabels. A third sibling, `\submaincmpdplain{⟨main ID⟩}{⟨sub ID⟩}`, writes both the main and the sublabel.

5.2 Properties of Compound Labels

Every label has a number of properties. The first property is of course its ID which identifies the label. The other properties are:

number An internal unique number.

counter-representation The counter representation associated with the label. This is the actual label that gets printed.

pre-label-code Code to be inserted before the label is printed.

post-main-label-code Code to be inserted after the *main* label is printed.

post-label-code Code to be inserted after the complete label is printed.

label-format Formatting commands for the label. This is most likely something like `\bfseries`.

* `\cmpdproperty{⟨ID⟩}{⟨property⟩}`

Get the associated property `⟨property⟩` of compound `⟨ID⟩`. This command is expandable.


```

1 \newcommand*\expandfull{\romannumeral-'0}%
2 \newcommand*\expandtwice{\detokenize\expandafter\expandafter\expandafter}%
3 \ttfamily
4 number: \cmpdproperty{benzene}{number}\par
5 counter-representation: \cmpdproperty{benzene}{counter-representation}\par
6 pre-label-code: \cmpdproperty{benzene}{pre-label-code}\par % empty
7 post-label-code: \cmpdproperty{benzene}{post-label-code}\par % empty
8 label-format: \expandtwice{\expandfull\cmpdproperty{benzene}{label-format}}

```

```

number: 11
counter-representation: 11
pre-label-code:
post-label-code:
label-format: \protect \bfseries

```

Similarly a sublabel has associated properties. Additionally to the obvious ones – its ID and the ID the main label it belongs to – these are

number An internal unique number.

counter-representation The counter representation associated with the label. This is the actual label that get's printed.

* `\subcmpdproperty{<main ID>}{<sub ID>}{<property>}`

Get the associated property *<property>* of subcompound *<sub ID>* of compound *<main ID>*. This command is expandable.

```

1 \ttfamily
2 main-compound: \subcmpdproperty{benzene}{OH}{main-compound}\par
3 number: \subcmpdproperty{benzene}{OH}{number}\par
4 counter-representation: \subcmpdproperty{benzene}{OH}{counter-representation}

```

```

main-compound: benzene
number: 3
counter-representation: c

```

5.3 Initiating Labels

Initiating labels is not the same as declaring them. In fact this may only be useful in order to keep track of defined labels. If you set the option `init CHEMNUM` will either issue a warning or an error (depending on the actual setting you chose) if a label is used *that hasn't been initiated*.

Initiating is done via the command `\initcmpd`:

```
\initcmpd{a,b,c,d}
```

You simply use all IDs you want to use like you would use them in `\cmpd`. `\initcmpd` also has an optional argument that allows you to set options for those labels.

6 Overview over the Available Options

Except for the `version` option all of the following options are either set as options to `\cmpd` or `\initcmpd` directly or via `\setchemnum{<options>}`, each time as a comma separated list of key/value pairs. Options that can be set via `\setchemnum` are marked with `global`, those that only have an effect when used with `\cmpd` and friends are marked with `compound`. Those marked with `all` can be set either way.

A few of the options only have an effect when used with the `\replacecmpd` command. They are marked with `replace`.

`version = 0|1` Default: 1

Choose the package version. This option can only be set as a package option!

`global` » `counter-within = {<counter>}`

Reset the compound numbers when `<counter>` is stepped.

`all` » `counter-format = arabic|alph|Alph|roman|Roman|greek|Greek` Default: arabic

The format of the number associated with the main compounds.

`all` » `sub-counter-format = arabic|alph|Alph|roman|Roman|greek|Greek` Default: alph

The format of the number associated with the sub compounds.

`all` » `compress = true|false` Default: false

If set to true a list of sublabels is compressed, *i. e.*, `10a,c,d,e` becomes `10a,c-e`.

`compound` » `pre-label-code = {<code>}` (initially empty)

Code to be inserted before a label.

`compound` » `post-label-code = {<code>}` (initially empty)

Code to be inserted after a label.

`all` » `main-sub-sep = {<code>}` Default: .

The separator symbol that is used in `\cmpd` to separate the `<main ID>` from a `<sub ID>`.

`all` » `format = {<formatting commands>}` Default: `\bfseries`

The default format of the labels.

`all` » `list-label-sep = {<code>}` Default: ,

The separator that is used to separate different `<main IDs>` in `\cmpd`.

6 Overview over the Available Options

<code>all</code>	<code>list-sep-two = {\code}</code>	Default: <code>_and_</code>
	The output separator between labels in a list that contains of two items.	
<code>all</code>	<code>list-sep-more = {\code}</code>	Default: <code>,_</code>
	The output separator between labels in a list that contains of more than two items.	
<code>all</code>	<code>list-sep-last-two = {\code}</code>	Default: <code>,_and_</code>
	The output separator between the last two labels in a list that contains of more than two items.	
<code>compound</code>	<code>sub-only = true false</code>	Default: <code>false</code>
	If true the command <code>\cmpd</code> will only print sublabels but no main labels.	
<code>compound</code>	<code>sub-all = true false</code>	Default: <code>false</code>
	If true the command <code>\cmpd</code> will print all sublabels belonging to the corresponding main label.	
<code>all</code>	<code>sub-list-sep-two = {\code}</code>	Default: <code>,</code>
	The output separator between labels in a sublist that contains of two items.	
<code>all</code>	<code>sub-list-sep-more = {\code}</code>	Default: <code>,</code>
	The output separator between labels in a sublist that contains of more than two items.	
<code>all</code>	<code>sub-list-sep-last-two = {\code}</code>	Default: <code>,</code>
	The output separator between the last two labels in a sublist that contains of more than two items.	
<code>all</code>	<code>sub-list-sep-range = {\code}</code>	Default: <code>--</code>
	The output separator between two labels in a sublist denoting a range. This is only used when the option <code>compress</code> is active.	
<code>global</code>	<code>replace-auto = true false</code>	Default: <code>true</code>
	When set to true this adds an incremented integer to the replacement tag.	
<code>global</code>	<code>replace-tag = {\code}</code>	Default: <code>TMP</code>
	The default replacement tag.	
<code>replace</code>	<code>tag = {\code}</code>	Default: <code>TMP\code</code>
	The local replacement tag.	
<code>global</code>	<code>replace-style = {\code}</code>	Default: <code>\sffamily</code>
	Additional \TeX code that it placed before the <code>\cmpd</code> command in the replacement.	
<code>replace</code>	<code>style = {\code}</code>	Default: <code>\sffamily</code>
	Local additional \TeX code that it placed before the <code>\cmpd</code> command in the replacement.	
<code>global</code>	<code>replace-pos = {\code pos}\code pos}</code>	Default: <code>bb</code>
	Options for <code>psfrag</code> 's <code>\psfrag</code> .	
<code>replace</code>	<code>pos = {\code pos}\code pos}</code>	Default: <code>bb</code>
	Local options for <code>psfrag</code> 's <code>\psfrag</code> .	

global » `init = true|main|false|strict|main-strict` Default: false

Determines how labels have to be initiated. false means that labels are initiated when they're used the first time in the text. true means that labels should be initiated in the preamble with `\initcmpd`. main is the same as true but only for main labels. strict means that if an un-initiated label is used an error is thrown. main-strict is the same as strict but only for main labels.

global » `log = true|false|silent|verbose` Default: false

Determines how the declaration of the labels will be logged. false means that no information is written to the .log file. true means that basic information is written to the .log file when a label or a sublabel is declared. silent is an alias of true. verbose means that detailed information is written to the .log file when a label or a sublabel is declared.

global » `show-keys = true|false|def|ref` Default: false

This option will write visual hints when a label is defined (choices true or def) or when a label is referenced (choices true or ref).

7 The Counter Settings

The default setting for main labels is arabic numbering which is the most common use case for compound labels. There are however cases when you might want a different numbering. The numbering also is not reset in a document. I have heard of cases where this might be desirable, though. This section will tell you how you can achieve those things.

7.1 Change the Numbering

The counter representation used for the main and the sublabels can be changed using the following options:

counter-format = arabic|alph|Alph|roman|Roman|greek|Greek Default: arabic

The format of the number associated with the main compounds.

sub-counter-format = arabic|alph|Alph|roman|Roman|greek|Greek Default: alph

The format of the number associated with the sub compounds.

Those options can be set globally with `\setchemnum` or localized for the single compounds.

```
1 \cmpd[counter-format=Alph]{Alpha} and L and v
2 \cmpd[counter-format=greek]{greek}
```

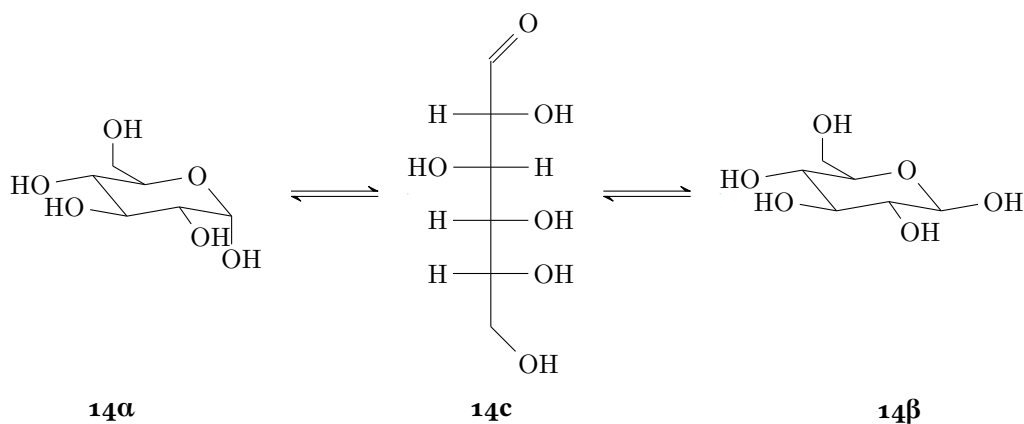
While it may not be necessary very often to change the default setting one could imagine cases where it makes sense, e. g., Greek sublabels for the anomers of a carbohydrate.

```
1 % this example uses the 'chemfig' package
2 \setatomsep{2em}
3 \definesubmol{r}{(-[4]H)(-[0]OH)}
```

```

4 \definesubmol{l}{(-[0]H)(-[4]HO)}
5 \labelcmpd[sub-counter-format=greek]{glucose.{alpha,beta}}
6 \labelcmpd{glucose.chain}
7 \centering
8 \schemestart
9   \small\chemfig{
10     ?(-[: -170]H0)
11     -[: -50](-[:170]H0)
12     -[:10](-[: -55,0.7]OH)
13     -[: -10](-[:6,0.8]OH)
14     -[:130]O-[: -170]?(-[:150,0.7]-[:2,0.7]OH)
15   }
16   \arrow(alpha--chain){<=>}
17   \small\chemfig{[6]O=[5]-!r-!l-!r-!r-[:7]OH}
18   \arrow(--beta){<=>}
19   \small\chemfig{
20     ?(-[: -170]H0)
21     -[: -50](-[:170]H0)
22     -[:10](-[: -55,0.7]OH)
23     -[: -10](-[:10]OH)(-[:6,,,draw=none]\vphantom{OH})
24     -[:130]O-[: -170]?(-[:150,0.7]-[:2,0.7]OH)
25   }
26   \arrow(@chain--chainlabel){0}[-90,.2] \cmpd{glucose.chain}
27   \arrow(@chainlabel--){0}[.2,5] \cmpd{glucose.beta}
28   \arrow(@chainlabel--){0}[180,2.3] \cmpd{glucose.alpha}
29 \schemestop

```



Should it ever be necessary to use another kind of counter representations than the ones already provided they can be added with this command:

`\newcmpdcounterformat{<name>}{<command>}`

Makes the label format *<name>* known to **CHEMNUM**. *<command>* needs to be a command that takes an integer number as argument and should return a formatted version of it.

The arabic and alph counter settings for example could have been defined like this:

```

1 \makeatletter
2 \newcmpdcounterformat{arabic}{\@arabic}
3 \newcmpdcounterformat{alph}{\@alph}
4 \makeatother

```

Although the name of the command suggests otherwise it can be used to overwrite the default definitions.

7.2 Reset the Numbering

There are cases when it actually might make sense to reset the counting of the compound labels. For this you can use this command:

`\resetcmpd[<integer>]` Default: 1
 Reset the numbering for main compound labels to start with *<integer>* again. This is the same as `\setcounter{cmpdmain}{<integer> - 1}` which means the change is global!

Be careful, though. You might end up with the same number for different compounds:

```

1 \resetcmpd The numbering starts with 1 again: \cmpd{h,i,j}, but:
2 two compounds with the same label: \cmpd{a,h}

```

The numbering starts with 1 again: **1**, **2**, and **3**, but: two compounds with the same label: **1** and **1**

8 Formatting Labels

As you will have noticed by now labels are typeset with a bold face with the default setting of `CHEMNUM`. This can be changed:

`format = {<formatting commands>}` Default: `\bfseries`
 The default format of the labels.

This options works in two ways: it sets the default format that is picked up by a compound label when it is defined. When you change it later already defined labels dont change:

```

1 \setchemnum{format=\itshape}
2 \cmpd{a,b} and \cmpd{new}

```

1 and **2** and *4*

If it is applied directly to the `\cmpd` command it changes the formatting for this usage of the command only, regardless if the label is new or not:

```

1 \cmpd[format=\itshape]{a,b} vs      1 and 2 vs 1 and 2
2 \cmpd{a,b}

```

There is more that you can do. Maybe you want to enclose labels in parentheses?

```

1 \cmpd[pre-label-code=(,post-label-code=)]{x, y, z.one }

```

(5), (6), and (7a)

Please note that these options only have an effect for *newly defined* labels since they belong to a label's properties.

Other options are the customization of the list separators:

`list-sep-two = {⟨code⟩}` Default: `and`

The output separator between labels in a list that contains of two items.

`list-sep-more = {⟨code⟩}` Default: `,`

The output separator between labels in a list that contains of more than two items.

`list-sep-last-two = {⟨code⟩}` Default: `,and`

The output separator between the last two labels in a list that contains of more than two items.

```

1 \setchemnum{list-sep-two=;,list-sep-more=;,list-sep-last-two=;}
2 \cmpd{a, b, c, d}

```

1;2;3;4

In the default settings these separators are language dependent. Setting them explicitly will overwrite the language sensitivity. If you only want to adapt the separators to your language have a look at section 11.

9 Replacing Tags in EPS or PS Files

Although it is quite possible to create reaction schemes within \LaTeX directly – for example with the chemfig package [Tel13] – many people prefer to use a program such as CHEMDRAW for it. In order to be able to use the labels with such schemes as well the following method is usually used:

- Create the scheme and place temporary tags like TMP1, TMP2 and so on where you want the compound labels to be.

9 Replacing Tags in EPS or PS Files

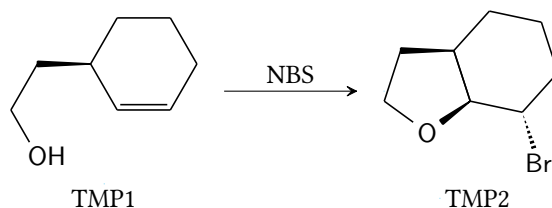


FIGURE 1: A scheme with temporary tags.

- Export the scheme as EPS or PS figure where you make sure that the tags are embedded as text strings.
- Include the EPS with `\includegraphics`. Right before that use `\replacecmpd` once for every temporary tag.

Figure 1 shows a scheme with temporary tags. It is produced with the following code where the class standalone has been used to get the figure only:

```

1 % code for figure 1
2 \documentclass{standalone}
3 \usepackage{graphicx,auto-pst-pdf}
4 \begin{document}
5   \includegraphics{scheme-tmp.ps}
6 \end{document}

```

The tags now can be replaced with labels. The result is shown in figure 2.

```

1 % code for figure 2
2 \documentclass{standalone}
3 \usepackage{graphicx,auto-pst-pdf,chemnum}
4 \begin{document}
5   \replacecmpd{Alc}% replaces TMP1
6   \replacecmpd{EtherBr}% replaces TMP2
7   \includegraphics{scheme-tmp.ps}
8 \end{document}

```

The replacement is done with the help of the psfrag package [GC98] and its `\psfrag` command. For details on this package and its command I refer to its documentation.

As you can see the labels are printed sans serif. This setting can of course be changed. The complete list of options is this:

`global » replace-auto = true|false` Default: true

When set to true this adds an incremented integer to the replacement tag.

`global » replace-tag = {<text>}` Default: TMP

The default replacement tag.

9 Replacing Tags in EPS or PS Files

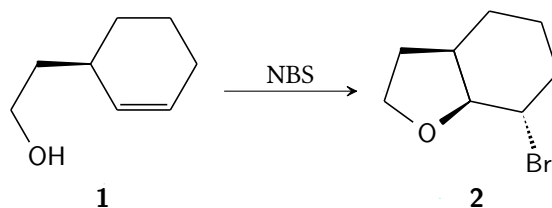


FIGURE 2: A scheme with temporary tags replaced with labels.

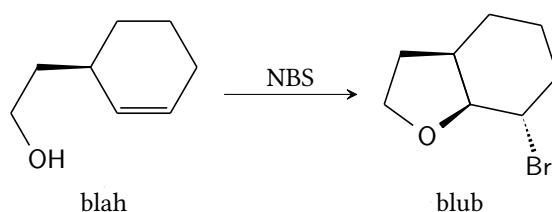


FIGURE 3: A scheme with arbitrary tags.

`replace » tag = {⟨text⟩}` Default: TMP⟨number⟩
 The local replacement tag.

`global » replace-style = {⟨code⟩}` Default: `\sffamily`
 Additional T_EX code that it placed before the `\cmpd` command in the replacement.

`replace » style = {⟨code⟩}` Default: `\sffamily`
 Local additional T_EX code that it placed before the `\cmpd` command in the replacement.

`global » replace-pos = {⟨TEX pos⟩}{⟨PS pos⟩}` Default: bb
 Options for psfrag's `\psfrag`.

`replace » pos = {⟨TEX pos⟩}{⟨PS pos⟩}` Default: bb
 Local options for psfrag's `\psfrag`.

If you have a scheme with arbitrary tabs like in figure 3 you can specify the `tag` option to `\replacecmpd`. Figure 4 demonstrates this. It also demonstrates that you can of course use sublabels in the `\replacecmpd` command.

```

1 % code for figure 3
2 \documentclass{standalone}
3 \usepackage{graphicx,auto-pst-pdf}
4 \begin{document}
5   \includegraphics{scheme-bla.ps}
6 \end{document}
  
```

If you don't want to use TMP⟨number⟩ as temporary tags but for example temp⟨number⟩ you can change this with following option:

10 Changing the Input Markers

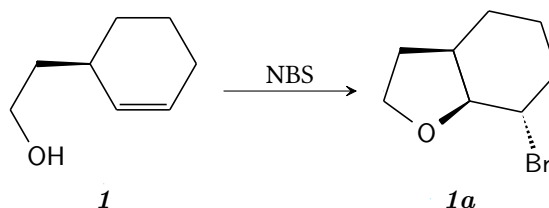


FIGURE 4: A scheme with arbitrary tags replaced with labels.

```
1 \setchemnum{replace-tag=temp}
```

The options `pos` and `replace-pos` refer to `\psfrag`'s optional arguments which determine the positioning of the \TeX box with respect to the `ps` box that is replaced. This is described in `psfrag`'s documentation.

```
1 % code for figure 4
2 \documentclass{standalone}
3 \usepackage{graphicx,auto-pst-pdf,chemnum}
4 \begin{document}
5   \setchemnum{replace-style=\itshape}
6   \replacecmpd[tag=blah]{main}% replaces TMP1
7   \replacecmpd[tag=blub]{main.sub}% replaces TMP2
8   \includegraphics{scheme-bla.ps}
9 \end{document}
```

10 Changing the Input Markers

In `CHEMNUM`'s labels there are two markers (or three, actually) that can't be part of a label name: the comma `,` and the dot `..`. You can change them with options:

`list-label-sep = {\token}` Default: `,`

The marker that is used to split an input list of main labels.

`sub-list-label-sep = {\token}` Default: `,`

The marker that is used to split an input list of sublabels.

`main-sub-sep = {\token}` Default: `.`

The marker that divides sublabels from main labels.

```

1 \setchemnum{
2   main-sub-sep = ! ,
3   list-label-sep = ;
4 }
5 \cmpd{a; b; c; e; g!two} \par
6 \cmpd{q!one,two,three,four,five}

```

1, 2, 3, 5, and **9b**
10a–e

11 Language Dependent Settings

A few settings of **CHEMNUM** depend on the language you chose with `babel` [Bra13] or `polyglossia` [Cha13]. Those regard the list separators. The language dependent strings are translated with the help of the translations [Nie13b] package. This package provides the means to define translations for strings associated with identification keys. **CHEMNUM** defines two strings. The available languages and the corresponding translations of the two strings are listed in table 1. Note that both the comma or a leading space as well as a trailing space are part of the translations. To make this obvious the relevant parts of the table are typeset in monotype and spaces are represented by `_`.

If you find your language missing or the translation to your language to be wrong please write me an email and I'll add your language or fix the wrong translation.

TABLE 1: Available languages

Language	chemnum-sep-two	chemnum-sep-last-two
English	<code>_and_</code>	<code>_and_</code>
American	<code>_and_</code>	<code>,_and_</code>
German	<code>_und_</code>	<code>_und_</code>
French	<code>_et_</code>	<code>_et_</code>
Spanish	<code>_y_</code>	<code>_y_</code>
Italian	<code>_e_</code>	<code>_e_</code>
Catalan	<code>_i_</code>	<code>_i_</code>
Portuguese	<code>_e_</code>	<code>_e_</code>
Dutch	<code>_en_</code>	<code>_en_</code>
Danish	<code>_og_</code>	<code>_og_</code>
Swedish	<code>_och_</code>	<code>_och_</code>
Finnish	<code>_ja_</code>	<code>_ja_</code>
Norwegian	<code>_og_</code>	<code>_og_</code>

12 Debugging Information

If you want information on the labels you have defined you can exploit the following options:

global » `log = true|false|silent|verbose` Default: false

Determines how the declaration of the labels will be logged. `false` means that no information is written to the `.log` file. `true` means that basic information is written to the `.log` file when a label or a sublabel is declared. `silent` is an alias of `true`. `verbose` means that detailed information is written to the `.log` file when a label or a sublabel is declared.

global » `show-keys = true|false|def|ref` Default: false

This option will write visual hints when a label is defined (choices `true` or `def`) or when a label is referenced (choices `true` or `ref`).

The option `log` will write information on a label to the `log` file when a label is defined. Depending on the choice (`true`, its alias `silent`, or `verbose`) this will be only the main information or detailed information including label properties. The following code shows an example when `log = {verbose}`:

```

1 .....
2 . chemnum info: defined new compound:
3 .   ID = a
4 .   internal number = 1
5 .   label = 1
6 .   pre label code = (
7 .   post label code = )
8 .   post main label code =
9 .   format = \bfseries
10 .....
```

The `show-keys` writes some visual information to the document itself:

```

1 \setchemnum{show-keys}
2 \cmpd{a} and a bit later \cmpd{b}.
```

$\overset{a}{\underset{1}{1}}$ and a bit later $\overset{b}{\underset{2}{2}}$.

The last example shows the information when a label is referenced. If a label is newly declared information is written to the margin like for this label with the ID showkey: 8 that again is referenced here: 8.

showkey

The option activates four commands:

`\cmpdshowdef{⟨ID⟩}`

Internal command used to display `⟨ID⟩` of a newly defined compound label when the option `show-keys` is used. The command is described in section 12.

`\cmpdshowref{⟨ID⟩}`

Internal command used to display `⟨ID⟩` of a referencing compound label when the option `show-keys` is used. The command is described in section 12.

`\subcmpdshowdef{⟨main ID⟩}{⟨sub ID⟩}`

Internal command used to display $\langle main ID \rangle$ and $\langle sub ID \rangle$ of a newly defined subcompound label when the option `show-keys` is used. The command is described in section 12.

`\subcmpdshowref{⟨main ID⟩}{⟨sub ID⟩}`

Internal command used to display $\langle main ID \rangle$ and $\langle sub ID \rangle$ of a referencing subcompound label when the option `show-keys` is used. The command is described in section 12.

This means you can customize the appearance of the information by redefining those commands. The ones that show the definition use a `\marginpar` in their default definition. This may cause them to disappear if issued somewhere `\marginpar` cannot be used. The following shows an equivalent definition with `\marginnote` from the `marginnote` package [Koh12]. (This definition has another drawback: it several `\marginnotes` can print over one another if issued in the same line.)

```

1 \renewcommand*\cmpdshowdef[1]{% /needs/ one mandatory argument
2   \marginnote{\fbox{\normalfont\ttfamily#1}}}
3 \renewcommand*\subcmpdshowdef[2]{% /needs/ two mandatory arguments
4   \marginnote{\fbox{\normalfont\ttfamily#2 (#1)}}}
5 a\cmpdshowdef{foo}\par
6 b\cmpdshowref{foo}\par
7 c\subcmpdshowdef{foo}{bar}\par
8 d\subcmpdshowref{foo}{bar}

```

a_{foo}
b_{foo}
c_{bar}
d_{bar}

foo

bar (foo)

Actually there are two other commands you could redefine – all four of the above commands are defined in terms of them:

```

1 \NewDocumentCommand\cmpdshowdef{m}{\chemnumshowdef{#1}}
2 \NewDocumentCommand\cmpdshowref{m}{\chemnumshowref{#1}}
3 \NewDocumentCommand\subcmpdshowdef{mm}{\chemnumshowdef{#2 (#1)}}
4 \NewDocumentCommand\subcmpdshowref{mm}{\chemnumshowdef{#2}}

```

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Index

A		
<code>all</code>	10	
B		
<code>babel</code> (package)	19	
<code>Bezos</code> , Javier	19	
<code>Braams</code> , Johannes	19	
C		
<code>Carlisle</code> , David	1, 16	
<code>Charette</code> , François	19	
<code>chemfig</code> (package)	15	
<code>chemgreek</code> (package)	1	
<code>chemmacros</code> (bundle)	1	
<code>\chemnumshowdef</code>	21	
<code>\chemnumshowref</code>	21	
<code>\cmpd</code>	2–8, 10–15, 17, 19 f.	
<code>\cmpdplain</code>	3, 8	
<code>\cmpdproperty</code>	3, 8 f.	
<code>\cmpdshowdef</code>	3, 20 f.	
<code>\cmpdshowref</code>	4, 20 f.	
<code>compound</code>	10	
<code>compress</code>	7, 10 f.	
<code>counter-format</code>	10, 12	
<code>counter-within</code>	10	
F		
<code>format</code>	10, 14	
G		
<code>global</code>	10	
I		
<code>init</code>	9, 12	
<code>\initcmpd</code>	2 f., 9 f., 12	
K		
<code>Kohm</code> , Markus	21	
L		
<code>l3kernel</code> (bundle)	1	
<code>l3packages</code> (bundle)	1	
<code>\labelcmpd</code>	3, 8, 13	
<code>list-label-sep</code>	10, 18	
<code>list-sep-last-two</code>	11, 15	
<code>list-sep-more</code>	11, 15	
<code>list-sep-two</code>	11, 15	
<code>log</code>	12, 20	
<code>LPPL</code>	1	
M		
<code>main-sub-sep</code>	10, 18	
<code>marginnote</code> (package)	21	
N		
<code>\newcmpdcounterformat</code>	3, 13 f.	
<code>Niederberger</code> , Clemens	1, 19	
P		
<code>polyglossia</code> (package)	19	
<code>pos</code>	11, 17 f.	
<code>post-label-code</code>	10	
<code>pre-label-code</code>	10	
<code>\psfrag</code>	11, 16 ff.	
<code>psfrag</code> (package)	1, 11, 16 ff.	
R		
<code>\refcmpd</code>	3, 7 f.	
<code>replace</code>	10	
<code>replace-auto</code>	11, 16	
<code>replace-pos</code>	11, 17 f.	
<code>replace-style</code>	11, 17	
<code>replace-tag</code>	11, 16	
<code>\replacecmpd</code>	2, 10, 16 ff.	
<code>\resetcmpd</code>	3, 14	
<code>Reutenauer</code> , Arthur	19	
S		
<code>\setchemnum</code>	2, 6, 10, 12, 14 f., 18 ff.	
<code>show-keys</code>	3 f., 12, 20 f.	
<code>standalone</code> (class)	16	
<code>style</code>	11, 17	
<code>sub-all</code>	11	
<code>sub-counter-format</code>	10, 12	
<code>sub-list-label-sep</code>	18	
<code>sub-list-sep-last-two</code>	11	
<code>sub-list-sep-more</code>	11	
<code>sub-list-sep-range</code>	11	
<code>sub-list-sep-two</code>	11	
<code>sub-only</code>	11	
<code>\subcmpdplain</code>	3, 8	
<code>\subcmpdproperty</code>	3, 9	
<code>\subcmpdshowdef</code>	4, 21	
<code>\subcmpdshowref</code>	4, 21	
<code>\submaincmpdplain</code>	3, 8	
T		
<code>tag</code>	11, 17	
<code>Tellechea</code> , Christian	15	
<code>The L^AT_EX₃ Project Team</code>	1	
<code>translations</code> (package)	1, 19	
V		
<code>version</code>	2, 10	