Unify subscript depths

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Packaged by Will Robertson

2007/09/02 v0.1

This small package comes essentially verbatim from the following `c.t.t.` post by Donald Arseneau: `http://groups.google.com/group/comp.text.tex/msg/f207c7535810d2c1`.[1]

Consider the standard output of a subscript with and without a superscript above:

$$M_n \; M'_n$$

The second n is lower due to TEX's default of jiggling the space when there are both superscripts and subscripts attached to a math symbol.

In some circumstances, this isn't particularly desirable; this package adjusts LATEX's behaviour to unify the position of the subscript in both cases:

$$M_n \; M'_n$$

Notice that to compensate for the higher subscript, the superscript position is slightly raised. The `[low-sup]` package option will suppress this change to the height of the superscripts.

[1] I am distributing this package with the LPPL license, while I assume that Donald's original code to be in the public domain. This license stuff can be a bit messy sometimes.

File I
subdepth implementation

This is the package.

```
\ProvidesPackage{subdepth}
  [2007/09/02 v0.1 Unify subscript depths]
```

Change History

v0.1

General: Initial version. 2

1 Loading and package options

Since this package is extracted from dchem, don't bother if that package is already loaded:

```
\@ifpackageloaded{dchem}{\PackageWarning{subdepth incorporated within dchem; aborting loading}\
```

Package option to lower the superscript height.

```
\newif\if@wspr@sup@low@
\DeclareOption{low-sup}{\@wspr@sup@low@true}
\ProcessOptions
```

2 Don's code

The comments that follow are Donald's. His out-commented diagnostic messages have been removed for clarity.

Set the fontdimen parameters for subscript and superscript position so that `C_2H_5^+` has both subscripts at the same vertical position. Do this by actually comparing `H_2` with `H_2^+` and adjusting the font's sub-lowering (16, 17) by half the difference and setting the super- raising (13, 14, 15) to the matching position. The settings (for all three fonts t,s,ss) are determined once per text-font-size and stored in the macro `\dch@sizet<size>` (e.g. `\csname dch@sizet12\endcsname`). Since some specific fonts are used in different roles at different text-font-sizes, the original (tfm) settings for each particular font are saved in a macro `\dch@size<size>` (no "t") before they are changed for the first time. When that font appears in a different role for another text-font size, those original settings are restored first before making changes.

```
\addto@hook\every@math@size{\dch@scr@hook}

\def\dch@scr@adjust{\@ifundefined{dch@sizet\f@size}%
  {\expandafter\dch@set@script\csname dch@sizet\f@size\endcsname}%
  {\csname dch@sizet\f@size\endcsname}}
```

textfont done last so it takes precedence in case it is the same as another style (like at `\tiny`)

`#1` = single-token command name for executing settings

```
\def\dch@set@script#1{%
  \begingroup % fontdimen settings are global anyway
    \frozen@everymath{}% Prevent recursion!
    \let#1\@empty
    \let\dch@do@one\relax
    \dch@set@one\scriptscriptstyle\scriptscriptfont#1\ssf@size
    \dch@set@one\scriptstyle\scriptfont#1\sf@size
    \dch@set@one\textstyle\textfont#1\f@size
  \endgroup
  #1}
```

(*Added conditional for the `[low-sup]` package option*):

```
\def\dch@set@one#1#2#3#4{%
  \@ifundefined{dch@size#4}%
   {\expandafter\xdef\csname dch@size#4\endcsname{%
      \unless\if@wspr@sup@low@
        \fontdimen13\the#2\tw@=\the\fontdimen13#2\tw@
        \fontdimen14\the#2\tw@=\the\fontdimen14#2\tw@
        \fontdimen15\the#2\tw@=\the\fontdimen15#2\tw@
      \fi
      \fontdimen16\the#2\tw@=\the\fontdimen16#2\tw@
      \fontdimen17\the#2\tw@=\the\fontdimen17#2\tw@}%
  }{\csname dch@size#4\endcsname}%
  \setbox\z@\hbox{$#1H_2$}\@tempdima\dp\z@
  \setbox\z@\hbox{$#1H_2^{+\vrule \@height 1em}$}%
```

I've adapted Donald's code to use eTEX methods for dimension calculating. `\@tempdima` is the 'new sub lowering'. In `\@tempdimb`, the first two terms are the 'adjustment', the second two the 'new super raising'.

```
  \ifdim\@tempdima<\dp\z@
    \@tempdima\dimexpr (\@tempdima+\dp\z@)/2 \relax
    \@tempdimb\dimexpr (\dp\z@-\@tempdima+\ht\z@-1em) \relax
    \xdef#3{#3\dch@do@one#2{\the\@tempdimb}{\the\@tempdima}}%
  \fi}
```

(*Added conditional for the `[low-sup]` package option*):

```
\def\dch@do@one#1#2#3{%
  \unless\if@wspr@sup@low@
    \fontdimen13#1\tw@#2\relax
    \fontdimen14#1\tw@\fontdimen13#1\tw@
    \fontdimen15#1\tw@\fontdimen13#1\tw@
  \fi
  \fontdimen\sixt@@n#1\tw@#3
  \fontdimen17#1\tw@
  \fontdimen\sixt@@n#1\tw@}%

\let\dch@scr@hook\dch@scr@adjust
\ifx\glb@currsize\f@size
```

```
  \dch@scr@adjust
\fi
```