Unify subscript depths

Code by Donald Arseneau
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.

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

\[ M_n \quad M'_n \]

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 \TeX’s behaviour to unify the position of the subscript in both cases:

\[ M_n \quad M'_n \]

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

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1I 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.

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

Change History

\textbf{v0.1}

General: Initial version. . . . . . . . . 2

1. **Loading and package options**

Since this package is extracted from \texttt{dchem}, don't bother if that package is already loaded:
\begin{verbatim}
\@ifpackageloaded{dchem}{\PackageWarning{subdepth incorporated within dchem; aborting loading}\endinput}{}
\end{verbatim}

Package option to lower the superscript height.
\begin{verbatim}
\newif\if@wspr@sup@low@
\DeclareOption{low-sup}{\@wspr@sup@low@true}
\ProcessOptions
\end{verbatim}

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 \texttt{\textbackslash dch@size<size>} (e.g. \texttt{\textbackslash csname dch@size12\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 \texttt{\textbackslash 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.

\begin{verbatim}
\addto@hook\every@math@size{\dch@scr@hook}
\def\dch@scr@adjust{\ifundefined{dch@size<size}{\expandafter\dch@set@script\csname dch@size<size\endcsname}\csname dch@size<size\endcsname}{\csname dch@size<size\endcsname}}
\end{verbatim}
textfont done last so it takes precedence in case it is the same as another style (like at \tiny)

\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@
\fontdimen16\the#2\tw@=\the\fontdimen16#2\tw@
\csname dch@size#4\endcsname} \fontdimen16\the#2\tw@=
\the\fontdimen16#2\tw@}{\csname dch@size#4\endcsname} 
\setbox\z@\hbox{$#1H_2$}\@tempdima\dp\z@
\setbox\z@\hbox{$#1H_2^{+\vrule \@height 1em}$}\@tempdimb
\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
\endgroup 
}(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@=\fontdimen14#1\tw@ 
\fi 
\fontdimen16#1\tw@=\fontdimen15#1\tw@ 
\fontdimen17#1\tw@ 
\fontdimen6\tw@=\fontdimen17#1\tw@
\let\dch@scr@hook\dch@scr@adjust 
\ifx\glb@currsize\f@size
3
\dch@scr@adjust
\fi