

[XyMTeX-Tips 130208a-ps] Disaccharides—Sugars

Shinsaku Fujita
Shonan Institute of Chemoinformatics and Mathematical Chemistry

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Question:

How can I draw sugars by using XyMTeX?

Answer:

The commands `\furanose` and `\pyranose` are supported by XyMTeX to draw monosaccharides. They are combined by using (y1) functions. The following code is effective in the plain mode of XyMTeX, the PostScript mode, and the PDF mode.

```
%130208a-psTest.tex
\documentclass{article}
%\usepackage{xymtex}%plain mode
\usepackage{xymtexp}% PostScript mode ... followed by dvips(k)
%\usepackage{xymtexpdf}% PDF mode ... followed by dvipdfmx
\begin{document}

\utrigonal{0==0;2==%
\furanose{4==(y1);1Sa==CH$_{2}$OH;2Sb==\lmoiety{HO}};%
2Sa==H;3Sb==H;3Sa==OH;4Sb==HOC\rlap{H$_{2}$}};%
3==\pyranose{1==(y1);2Sa==OH;3Sb==OH;4Sa==HO;5Sb==CH$_{2}$OH}}

\end{document}
```

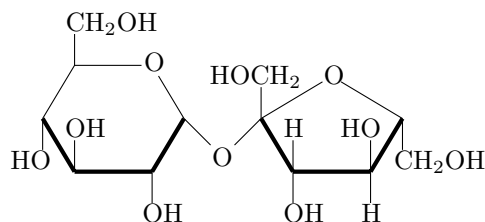
The present XyMTeX-tip deals with the PostScript mode. The code named “130208a-psTest.tex” is executed by L^AT_EX as follows:

```
c:\> latex 130208a-psTest
```

The resulting .dvi file is converted into the corresponding .ps file:

```
c:\> dvips -Pd1 -D2400 130208a-psTest
```

Thereby, we obtain a .ps file (“130208a-psTest.ps”), which contains the following structural formula of a disaccharide.

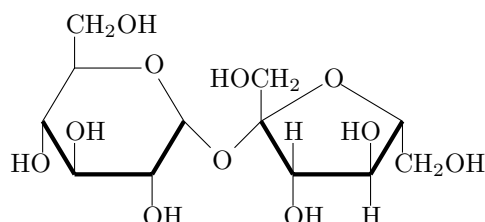


The .ps file is browsed by the GSview system. The .ps file can be further converted into a .pdf file by using an appropriate converter, e.g., the Adobe distiller.

Further Techniques

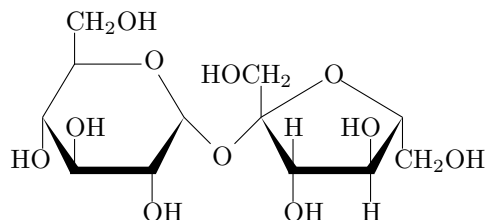
The same formula can be drawn by using lower-level commands `\fivesugarh` and `\sixsugarh`, which are capable of specifying the position of an oxygen atom in each sugar skeleton.

```
\utrigonal{0==0;2==%
\fivesugarh{5==0}{4==(y1);1Sa==CH$_{2}$OH;2Sb==\lmoiety{HO}};%
2Sa==H;3Sb==H;3Sa==OH;4Sb==HOC\rlap{H$_{2}$}};%
3==\sixsugarh{6==0}{1==(y1);2Sa==OH;3Sb==OH;4Sa==HO;5Sb==CH$_{2}$OH}}
```



Inner wedged bonds can be drawn by using the `\WedgeAsSubst` command. The following code uses the `\psline` command of the PSTricks package.

```
\utrigonal{0==0;2==%
\fivesugarh{5==0;1s==\WedgeAsSubst(0,0)(-3,-5){120}};%
4s==\WedgeAsSubst(0,0)(3,-5){120}};%
3s==\psline[linewidth=2.8pt,linestyle=solid,linecolor=black](-17,0)(307,0)%
}{4==(y1);1Sa==CH$_{2}$OH;2Sb==\lmoiety{HO}};2Sa==H;%
3Sb==H;3Sa==OH;4Sb==HOC\rlap{H$_{2}$}}[abc];%
3==\sixsugarh{6==0;1s==\WedgeAsSubst(0,0)(-3,-5){120}};%
4s==\WedgeAsSubst(0,0)(3,-5){120}};%
3s==\psline[linewidth=2.8pt,linestyle=solid,linecolor=black](-17,0)(307,0)%
}{1==(y1);2Sa==OH;3Sb==OH;4Sa==HO;5Sb==CH$_{2}$OH}[abc]}
```



In place of the `\psline` command, a more general command `\PutBondLine` can be used in the PostScript mode as well as in the PDF mode. Thus, the following code is processed by the PostScript mode of \LaTeX .

```
\utrigonal{0==0;2==%
\fivesugarh{5==0;1s==\WedgeAsSubst(0,0)(-3,-5){120}};%
4s==\WedgeAsSubst(0,0)(3,-5){120}};%
3s==\PutBondLine(-15,0)(305,0){3.2pt}%
}{4==(y1);1Sa==CH$_{2}$OH;2Sb==\lmoiety{HO}};2Sa==H;%
3Sb==H;3Sa==OH;4Sb==HOC\rlap{H$_{2}$}}[abc];%
3==\sixsugarh{6==0;1s==\WedgeAsSubst(0,0)(-3,-5){120}};%
4s==\WedgeAsSubst(0,0)(3,-5){120}};%
3s==\PutBondLine(-15,0)(305,0){3.2pt}%
}{1==(y1);2Sa==OH;3Sb==OH;4Sa==HO;5Sb==CH$_{2}$OH}[abc]}
```

Thereby, we obtain the same formula of the sugar as depicted above:

