

Writing Tools for Chemistry

Introduction

In this laboratory activity, you will work with two different software applications that allow you to prepare more professional-looking scientific papers. The skills you learn in this laboratory should complement and enhance some of the data analysis and reporting skills you learned in the first semester of this course. For review, go to <http://webs.anokaramsey.edu/chemistry/chem1061> and select Laboratory Reports: *Lab 3: [Spreadsheets I](#)* and *Lab 4: [Spreadsheets II](#)*.

Each of these applications may be accessed from and integrated into any Microsoft *Word* document enabling you to produce professional-looking scientific papers directly from your word processor. Rather than giving you complete instructions of how to use the two applications, which is close to impossible, your professor will demonstrate many of the features in the laboratory. Just as it is with anything new, it will take you some time before you begin feeling comfortable with their use. Few of you probably sat down with an instruction manual to learn how to use a word processor, web browser, or spreadsheet. Rather, you gained knowledge with experience. The same will probably hold true in this instance.

Equation Editing

Equation editing may be done with either Microsoft *Equation 3.0* or the built-in equation editor in *Word 2007*. Equation editors are applications that provide the ability to write many types of mathematical equations and symbols.

- If you are planning to work on this assignment on a computer that has *Word 2003* or earlier version installed, you must use *Equation 3.0* for your work to be compatible with the earlier version. *Equation 3.0* is integrated into all recent versions of Microsoft *Office* and Microsoft *Works*. While *Equation 3.0* may be run directly as an application, it is typically installed on most computers as an “object” in *Word* or *PowerPoint*.

In order to use *Equation 3.0*, you will need to first open Microsoft *Word* on your computer. Then under the “Insert” menu, select “Object”. Then under object type, select “Microsoft Equation 3.0”. You will see a number of templates for mathematical symbols and equations. The instructor will demonstrate a few of the templates before you begin your assignment.

- If you are will be using only computers with *Word 2007* installed, you may use the equation editor integrated into *Word 2007*. The integrated equation editor may be found by looking under the “Insert” tab and selecting “Equation”. You will see a number of templates for mathematical symbols and equations. The instructor will demonstrate a few of the templates before you begin your assignment.

Drawing Molecules

Molecules may be drawn using chemical drawing programs such as *ChemSketch* or *ISIS Draw*.

ACD ChemSketch 12.0 Freeware

The second application you will use is *ChemSketch 12.0 Freeware*, used to draw molecules and write chemical equations and formulae. It can also generate color-coded 3D structures that may be viewed and rotated in any direction. *ChemSketch 12.0 Freeware* may also optimize all 2D and 3D structures. It is designed for use in both organic and inorganic chemistry. *ChemSketch 12.0 Freeware* has been installed on all of the laboratory computers in the upper science building and should eventually be installed in the main open computer lab on the Coon Rapids Campus. If you would like to give it a try at home, you may download it at <http://www.freechemsketch.com>.

Note: Do not install software on any college computer.

Once installed, you will be able launch *ChemSketch 12.0 Freeware* directly from the Start menu or the desktop. However, to integrate it into your *Word* documents, you will need to first open *Microsoft Word*. Then under the “Insert” menu, select “Object”. Then under object type, select “ACD/ChemSketch”. Alternatively, you may create objects directly in *ChemSketch* and copy and paste them directly into your *Word* document. Upon opening *ChemSketch*, you will see a number of templates for chemical structures and equations. The professor will demonstrate a few of the templates before you begin your assignment.

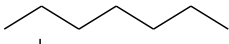
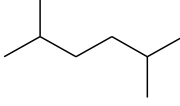
Accelrys Draw 4.0 no-fee or Symyx Draw 3.3

An alternative to *ChemSketch* is Symyx’s *Accelrys Draw 4.0 no-fee* also used to draw molecules and write chemical equations and formulae. It is designed primarily for organic chemistry, though it may also be used for inorganic chemistry. *Symyx Draw 3.3* (the version previous to *Accelrys Draw 4.0*) is installed on all of the laboratory computers in the science building and in the main computer lab on the Coon Rapids Campus. If you would like to use it at home, you may download it at <http://www.symyx.com/downloads/index.jsp>. *Note: Do not install software on any college computer.*

You may launch *Symyx Draw 3.3* directly from the Start menu or the desktop. However, to integrate it into your *Word* documents, you will need to first open *Microsoft Word*. Then under the “Insert” menu, select “Object”. Then under object type, select “Symyx Draw document”. You will see a number of templates for chemical structures and equations.

Assignment

Open a new document in Microsoft *Word*. Place your name(s), the course number, date, and professor's name in the upper left hand corner of the first page. At your instructor's discretion, you may be asked to complete this lab on an individual basis or in pairs. Save your document regularly to avoid accidental loss of data. Since this assignment will be submitted electronically, please use a filename convention of "Lastname Writing Tools" or "Lastname1 LastName2 Writing Tools" in naming your document to help the professor keep files organized.

- Place the following items in your document using *Equation 3.0* objects or the *Word 2007* integrated equation editor. The page numbers refer to the 1st edition of the Tro *Principles of Chemistry* text.
 - the molarity equation in the center of p. 127
 - the 2nd equation under "Clausius-Clapeyron Equation" in the middle of the back cover
 - the first chemical equation showing the catalyst below the arrow on p. 503
 - the solution for the quadratic equation, given on p. 534 (first box, left column)
 - the second equation beginning with "S =" a little more than halfway down p. 626
 - the nuclide symbol of nucleus having 19 protons and 21 neutrons
 - the setup using dimensional analysis (see p.118 for example) *and* the solution for problem 12, part c (Chapter 4) on p. 156
- Place the following items in your document using *ChemSketch 12.0 Freeware* (or *Accelrys Draw 4.0*) objects:
 - the equation under "For Practice 14.4" on p.525, showing the double arrow
 - the molecule, , with the IUPAC name generated by *ChemSketch*
 - the molecule, , with the IUPAC name generated by *ChemSketch*
 - the organic molecule in problem 14c on p. 776, with the IUPAC name generated by *ChemSketch* (retain shape/structure shown in problem)
 - the molecule in 39a on p. 778, with the IUPAC name generated by *ChemSketch* (retain shape/structure shown in problem)
 - the molecule in 43b on p. 778, with the IUPAC name generated by *ChemSketch* (retain shape/structure shown in problem)
 - a molecule of PBr₃, drawn to the best of your ability, giving the appropriate name
- Future *ChemSketch 12.0 Freeware* assignment for generating and optimizing 2D and 3D structures.

Submitting Your Assignment

Follow your instructor's directions for submitting this lab report. Remember to name the file as specified near the beginning of Assignment section ("Lastname Writing Tools" or "Lastname1 LastName2 Writing Tools"). If you are emailing your report, use the subject line "Chem 1062: Writing Tools Lab". If you worked in pairs and are submitting this assignment on an individual basis, please underline your own name and include your lab partner's name on the assignment.

