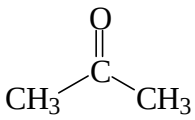
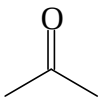
CHEM1102 Problem Sheet 1 (Week 1)

There are a number of important learning resources available on your unit area on the First Year Chemistry website: http://firstyear.chem.usyd.edu.au/chem1102 Spend time getting familiar with this website - look at available resources, which include self help quizzes, games and calculators.

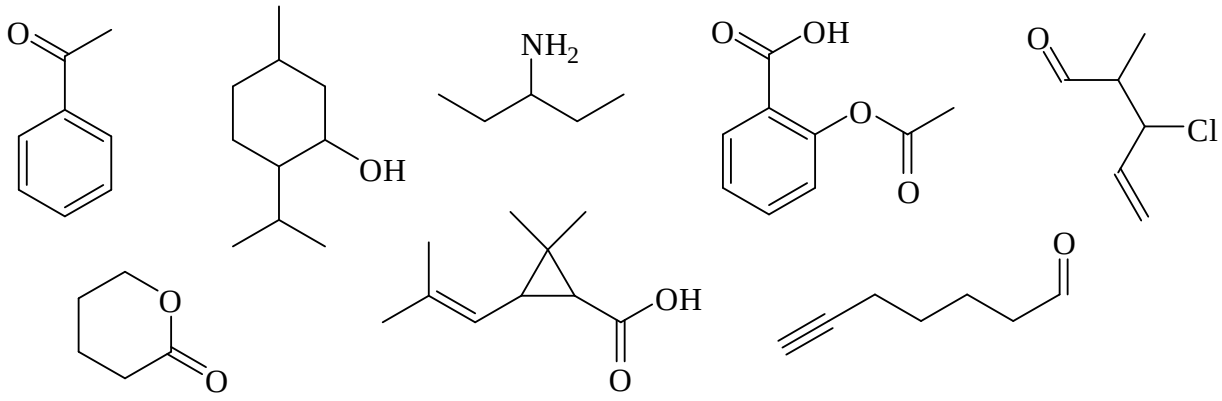
One of the most important resources is **ChemCAL,** an interactive tutorial/quiz program which covers most of the first year chemistry topics. Past students have found the program's interactive tutorials very useful. A link to ChemCAL is provided on the menu of all First Year Chemistry webpages. You log on to ChemCAL using your course code ('1102') as username, and *helium* as the password. (Note that none of the marks you receive in the various ChemCAL quizzes are ever recorded or assessed, and multiple attempts are OK!) . **Work through the ChemCAL modules "*Alkanes - Structure and Nomenclature*" and "*Organic Functional Groups*".**

Solutions to the problems below can be accessed from the 'Resources' page on your unit area on the First Year Chemistry website and on eLearning. If you have any problems, remember to ask your tutor for help during your first tutorial in week 1.

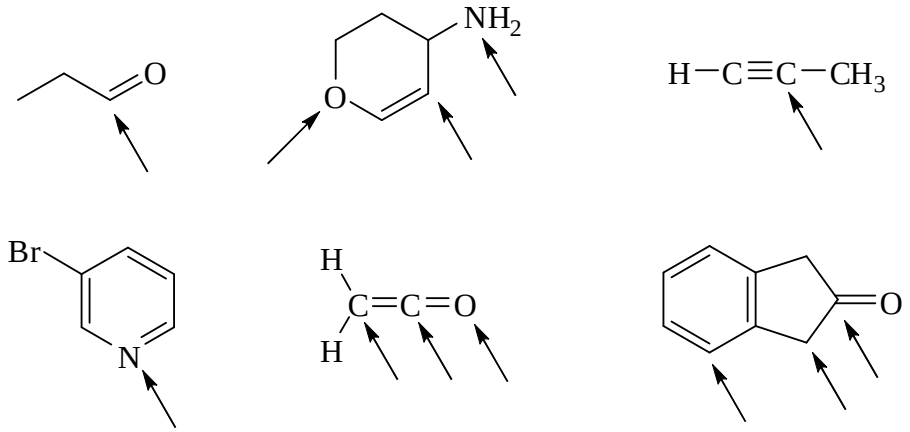
1. Give the condensed structural formula and stick representation of the following molecules. In the stick representations do not show the C-H bonds but try to represent the appropriate bond angles in the rest of the molecule.

Compound	Condensed structural formula	Stick representation
CH_3COCH_3		
$CH_3CHBrCH_2Cl$		
$(CH_3)_2CHCH(CH_3)_2$		
$(CH_3)_2CCH_2$		
CH_3CH_2COOH		
$CH_3COOCH_2CH_3$		
$CH_3COOCOCH_3$		
benzamide ($C_6H_5CONH_2$)		

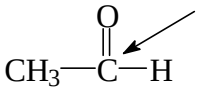
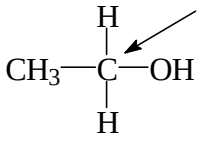
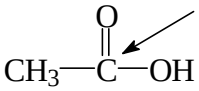
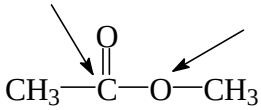
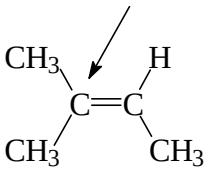
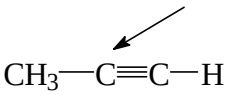
2. Determine molecular formulas and identify the functional groups in the following compounds:



3. Give the hybridisation of the atoms indicated by arrows in the following compounds.



4. For each of the following compounds, give the approximate bond angles at the atoms indicated by the arrows and re-draw the structures in stick representations.

(a) 	(b) 	(c) 	(d) 
(e) 	(f) 	(g)