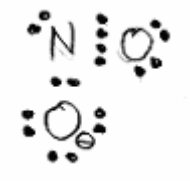
Chemistry 135 Semester 01-2012
Homework for Submission #6

Answer the following questions and submit them for marking on or before Tuesday 10th April in the chemistry drop box. Only answers showing full working can attract full marks. Express your answer to the correct number of significant figures. Answers showing evidence of copying will attract zero marks.

1) Draw Lewis electron-dot diagrams for the following molecules and ions. Show all lone pairs and any formal charges. (10)

a)	water	b)	ammonia	c)	carbon tetrafluoride	d)	carbon dioxide
e)	nitrogen oxide	f)	ethene	g)	carbon monoxide	h)	nitrate ion
i)	ammonium ion	j)	beryllium difluoride				

Indicate against each diagram whether each of the above molecules is expected to have a dipole moment. (5)
Example: the nitrate ion



- dipole moment

2) What is meant by the *valence shell electron-pair repulsion (VSEPR)* theory? Explain carefully how it can predict the shape of the $SnCl_2$ molecule and describe this shape with a diagram and a name. (5)

3) The values given in the table below are the boiling points of the hydrides of the group VII elements in °C. Sketch a graph of these boiling points against the atomic number of the element. Explain the main features of your graph with reference to hydrogen bonding, dipole/dipole forces and London dispersion forces. (5)

HF	HCl	HBr	HI
20	-85	-67	-35