Year 11 Chemistry NAME_____

Bonding Assignment 1

1. Identify the following as most likely to be examples of ionic, covalent or metallic bonding:
   a) A soft powder with a low melting point /1
   b) A substance which has a high melting point and conducts well as a solid /1
   c) A flammable liquid which evaporates quickly /1

2. Explain why:
   a) ionic substances conduct electricity when melted or dissolved in water but *not* as a solid /2
   b) metallic substances conduct whether solid or molten (melted) /2

3.
   a) State the meaning of the term "electronegativity". /1
   b) State the difference between primary and secondary forces. /1
   c) Explain, with the aid of a diagram, how hydrogen bonding works. /3

4. State whether each of the following is ionic, covalent or metallic, and hence identify any which will definitely not form molecules.
   (i) NaI (ii) Na (iii) I_2 (iv) IF_7 /3

5. Draw electron dot diagrams for the following:
   a) Oxygen gas /1
   b) Carbon dioxide /1

6. For the following molecules,
   - Draw the bonding and shape of the following
   - Show any bond and molecular dipoles
   - Name the shape

   a) Oxygen gas /2
   b) Carbon dioxide /3
   c) H_2S /3
   d) CO_3^{2-} /3
   e) NF_3 /3
   f) CCl_4 /3

7. K and Ca are right next to each other on the periodic table, but KF has a melting point of 840°C whereas CaF_2 has a melting point of 2500°C.
   Explain why their melting points are so different. /3

8. Consider the trend of boiling points of group V elements bonded with fluorine:

Formula	**Name**	**Boiling point (°C)**
NF_3	nitrogen trifluoride	−129.1
PF_3	phosphorus trifluoride	−101.8
AsF_3	arsenic trifluoride	60.4
SbF_3	antimony trifluoride	376
BiF_3	bismuth trifluoride	649

   Explain why the boiling point increases going down the list. /3