**Starters for 10: Covalent Bonding**

**1 The nature of chemical bonds**

**1.1 Covalent dot and cross**

Draw dot and cross diagrams to illustrate the bonding in the following covalent compounds. If you wish you need only draw the outer shell electrons;

(2 marks for each correct diagram)

**1.** Water, H2O

**2.** Carbon dioxide, CO2

**3.** Ethyne, C2H2

**4.** Phosphoryl chloride, POCl3

**5.** Sulfuric acid, H2SO4

**2 Covalent bonding**

**2.1 Co-ordinate bonding**

By drawing dot and cross diagrams, decide which of the species below contain a co-ordinate or dative covalent bond in which both electrons in one of the covalent bonds is provided by a single atom.

**1.** H2S (2 marks)

**2.** NH4+ (2 marks)

**3.** H3NBF3 (2 marks)

**4.** CO (2 marks)

**5.** PF3 (2 marks)