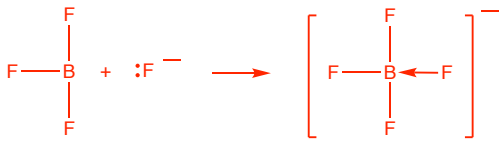
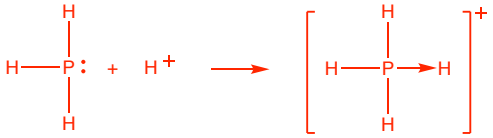
THE NATURE OF BONDS

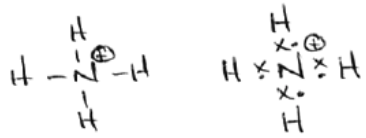
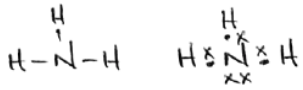
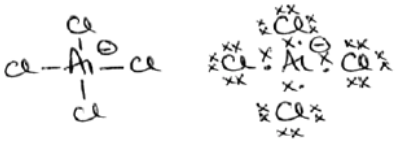
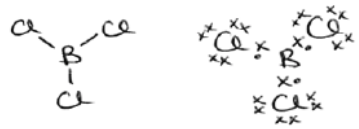
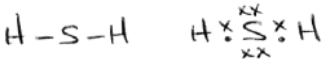
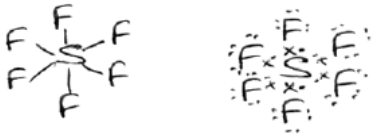
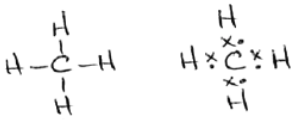
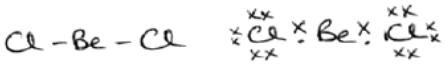
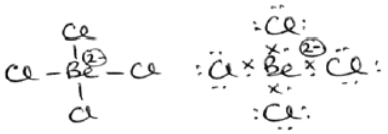
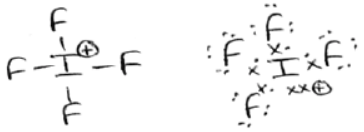
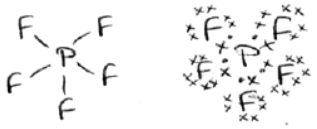
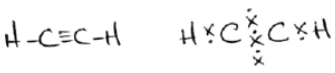
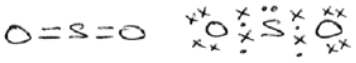
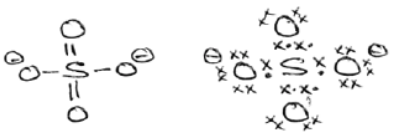
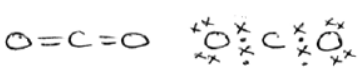
TASK 1	Predict (with reasons) which one of each pair of ionic compounds will have the higher melting point by considering size and charge of ions.
a) sodium chloride v potassium chloride	sodium chloride • Na^+ ions are smaller than K^+ ions • so there will be a stronger attraction between positive and negative ions
b) sodium fluoride v magnesium fluoride	magnesium fluoride • Mg^{2+} ions are smaller and more highly charged than Na^+ ions • so there will be a stronger attraction between positive and negative ions
c) aluminium oxide v sodium oxide	aluminium oxide • Al^{3+} ions are smaller and more highly charged than Na^+ ions • so there will be a stronger attraction between positive and negative ions

TASK 2	See over the page

TASK 3	Draw a diagram to show the formation of a co-ordinate bond in the following. In each case, state how the bond forms.
a) BF_3 with F^- to form BF_4^-	 lone pair of electrons is donated from F^- to B on BF_3
b) PH_3 with H+ to form PH_4^+	 lone pair of electrons is donated from P on PH_3 to H^+

TASK 4	Predict (with reasons) which one of each pair of metals will have the higher melting point.
a) sodium v potassium	sodium • Na atoms are smaller than K atoms • so there will be a stronger metallic bonding
b) sodium v magnesium	magnesium • Mg atoms are smaller than Na atoms • magnesium has more delocalised electrons than sodium • so there will be a stronger metallic bonding
c) potassium v aluminium	aluminium • Al atoms are smaller than K atoms • aluminium has more delocalised electrons than potassium • so there will be a stronger metallic bonding

TASK 2 Draw stick and then dot-cross diagrams for each of the following molecules and ions.

1) F_2		11) NH_4^+	
2) NH_3		12) $AlCl_4^-$	
3) O_2		13) BCl_3	
4) H_2S		14) SF_6	
5) CH_4		15) $BeCl_2$	
6) H_2		16) $BeCl_4^{2-}$	
7) PF_3		17) IF_4^+	
8) PF_5		18) C_2H_2	
9) SO_2		19) SO_4^{2-}	
10) CO_2		20) NO_3^-