



THE NATURE OF BONDS


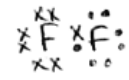
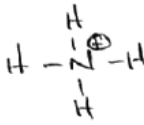
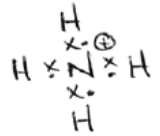
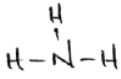
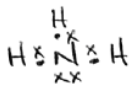
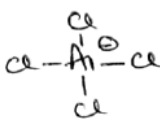
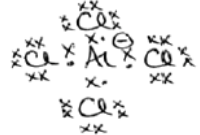

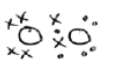
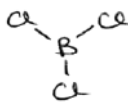
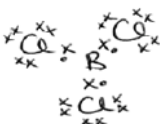
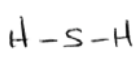
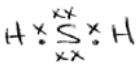
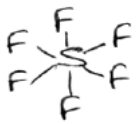
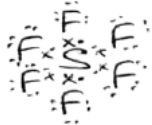
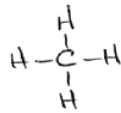
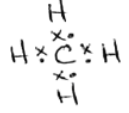
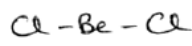
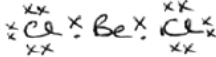


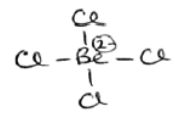
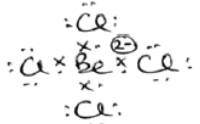
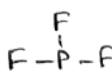
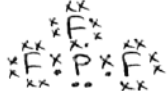
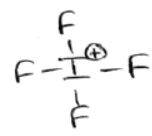
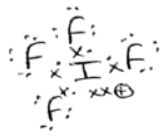


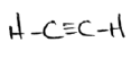
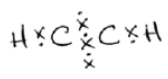
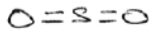
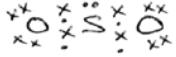
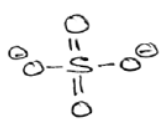
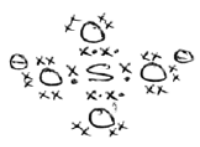
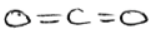
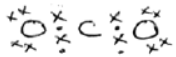
TASK 1 Predict (with reasons) which one of each pair of ionic compounds will have the higher melting point by considering size and charge of ions.	
a) sodium chloride v potassium chloride	sodium chloride <ul style="list-style-type: none">• Na^+ ions are smaller than K^+ ions• so there will be a stronger attraction between positive and negative ions
b) sodium fluoride v magnesium fluoride	magnesium fluoride <ul style="list-style-type: none">• Mg^{2+} ions are smaller <u>and</u> 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 <ul style="list-style-type: none">• Al^{3+} ions are smaller <u>and</u> 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^-	<p>lone pair of electrons is donated from F^- to B on BF_3</p>
b) PH_3 with H^+ to form PH_4^+	<p>lone pair of electrons is donated from P on PH_3 to H^+</p>

TASK 4 Predict (with reasons) which one of each pair of metals will have the higher melting point.	
a) sodium v potassium	sodium <ul style="list-style-type: none">• Na^+ ions are smaller than K^+ ions• so there will be a stronger metallic bonding
b) sodium v magnesium	magnesium <ul style="list-style-type: none">• Mg^{2+} ions are smaller than Na^+ ions• Mg^{2+} ions are more highly charged than Na^+ ions• magnesium has more delocalised electrons than sodium• so there will be a stronger metallic bonding
c) potassium v aluminium	aluminium <ul style="list-style-type: none">• Al^{3+} ions are smaller than K^+ ions• Al^{3+} ions are more highly charged than K^+ ions• 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 ₂ S	 	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 ₂ H ₂	 
9) SO ₂	 	19) SO ₄ ²⁻	 
10) CO ₂	 	20) NO ₃ ⁻	