***Chemistry***

**7: Chemical Bonding and Molecular Structure**

**7.2: Covalent Bonding**

11. Why is it incorrect to speak of a molecule of solid NaCl?

Solution

NaCl consists of discrete ions arranged in a crystal lattice, not covalently bonded molecules.

13. Predict which of the following compounds are ionic and which are covalent, based on the location of their constituent atoms in the periodic table:

(a) Cl2CO

(b) MnO

(c) NCl3

(d) CoBr2

(e) K2S

(f) CO

(g) CaF2

(h) HI

(i) CaO

(j) IBr

(k) CO2

Solution

ionic: (b), (d), (e), (g), and (i); covalent: (a), (c), (f), (h), (j), and (k)

15. From its position in the periodic table, determine which atom in each pair is more electronegative:

(a) Br or Cl

(b) N or O

(c) S or O

(d) P or S

(e) Si or N

(f) Ba or P

(g) N or K

Solution

(a) Cl; (b) O; (c) O; (d) S; (e) N; (f) P; (g) N

17. From their positions in the periodic table, arrange the atoms in each of the following series in order of increasing electronegativity:

(a) C, F, H, N, O

(b) Br, Cl, F, H, I

(c) F, H, O, P, S

(d) Al, H, Na, O, P

(e) Ba, H, N, O, As

Solution

(a) H, C, N, O, F; (b) H, I, Br, Cl, F; (c) H, P, S, O, F; (d) Na, Al, H, P, O; (e) Ba, H, As, N, O

19. Which atoms can bond to sulfur so as to produce a positive partial charge on the sulfur atom?

Solution

N, O, F, and Cl

21. Identify the more polar bond in each of the following pairs of bonds:

(a) HF or HCl

(b) NO or CO

(c) SH or OH

(d) PCl or SCl

(e) CH or NH

(f) SO or PO

(g) CN or NN

Solution

(a) HF; (b) CO; (c) OH; (d) PCl; (e) NH; (f) PO; (g) CN

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