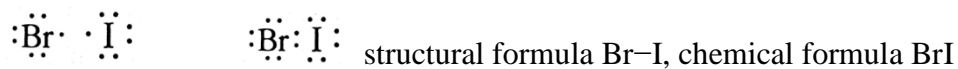


Chapter 6

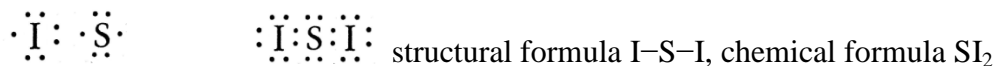
Answers to Questions

1. A non-electrolyte.
2. Ionic compounds contain three-dimensional arrays of alternating anions and cations. The term formula unit is the simplest ratio of anion and cation. A molecule is a combination of atoms held together by covalent bonds.
3. The cations have the same electron configuration as the preceding noble gas in the Periodic Table.
4. The alternating positive and negative ions are held together by electrostatic attractions.
5. (a) 1+ (b) 2- (c) 1-
6. (a) 2+ (b) 3- (c) 3+
7. (a) Li⁺ (b) Ca²⁺ (c) Cl⁻
8. (a) Fe³⁺ (b) Si⁴⁻ (c) Zn²⁺
9. (a) 27 p, 25 e (b) 47 p, 46 e (c) 7 p, 10 e
10. (a) 8 p, 10 e (b) 35 p, 36 e (c) 28 p, 26 e
11. (a) C⁴⁻ (b) Al³⁺
12.
$$[\text{Na}]^+ [\text{:}\ddot{\text{I}}\text{:}]^-$$
 1:1 ion ratio, chemical formula NaI
13.
$$2[\text{K}]^+ [\text{:}\ddot{\text{S}}\text{:}]^{2-}$$
 2:1 ion ratio, chemical formula K₂S
14.
$$3[\text{Ca}]^{2+} 2[\text{:}\ddot{\text{N}}\text{:}]^{3-}$$
 3:2 ion ratio, chemical formula Ca₃N₂
15. H₂, N₂, O₂, F₂, Cl₂.

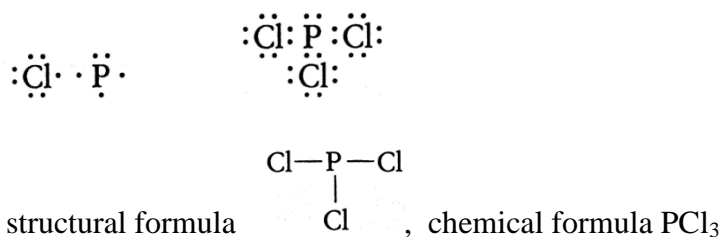
16.



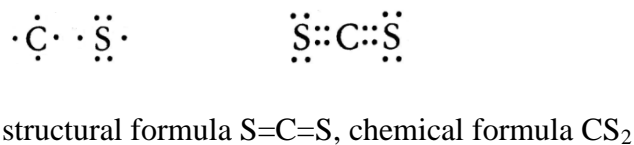
17.



18.



19.



20.



structural formula H–C≡N, chemical formula HCN

21. The compound is ionic. It does not conduct electricity in the solid phase as the ions are held in place in the crystal lattice. Only when the compound melts, or it is dissolved in water, are the ions free to move and conduct electricity.

22. (a) H₂S or SH₂

(b) If the bond angle is not 180°, then there must also be one or two lone pairs on the sulfur atom “forcing” the two hydrogen atoms close together.

23. (a) PCl₅ (or PF₅)

(b) Five – as in each P–Cl bond, phosphorus would be contributing one electron and the chlorine the other.

24. A space-filling model provides the better impression of how a molecule would look. However, it is impossible to see the bond angles or whether the bonds are single, double, or triple.

25. A ball-and-stick model is better for illustrating the bond angles and the number of bonds. However, molecules do not have “sticks” joining the atoms together thus it does not represent how a molecule would “look.”