## **II. Balancing Chemical Equations**

Balance each of the following chemical equations:

- 1.  $SiO_2(s) + C(s) \rightarrow Si(l) + CO$
- 2.  $CaC_2(s) + H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$
- 3.  $C\ell_2(g) + KI(aq) \rightarrow KC\ell + I_2(s)$
- 4.  $Ag(s) + H_2S(g) \rightarrow Ag_2S(s) + H_2(g)$
- 5. BaO(s) + A $\ell$ (s)  $\rightarrow$  A $\ell$ <sub>2</sub>O<sub>3</sub>(s) + Ba(s)
- 6.  $Na_2O_2(s) + H_2O(g) + CO_2(g) \rightarrow NaHCO_3(s) + O_2(g)$
- 7.  $K_2CO_3(s) \rightarrow K_2O(s) + CO_2(g)$
- 8.  $KBr(s) + H_3PO_4(aq) \rightarrow K_3PO_4(aq) + HBr$
- 9.  $CaH_2(s) + H_2O(I) \rightarrow Ca(OH)_2(aq) + H_2(g)$
- 10.  $PI_3(s) + H_2O(I) \rightarrow H_3PO_3(aq) + HI(g)$
- 11.  $A\ell(s) + F_2(g) \rightarrow A\ell F_3(s)$
- 12.  $CaO(s) + SO_3(g) \rightarrow CaSO_4(s)$
- 13.  $FeCO_3(s) + H_2CO_3(aq) \rightarrow Fe(HCO_3)_2(aq)$
- 14.  $CaO(s) + C(s) \rightarrow CaC_2(s) + CO_2(g)$
- 15.  $PC\ell_5(I) + H_2O(I) \rightarrow H_3PO_4(aq) + HC\ell(g)$
- 16.  $Fe_2O_3(s) + HNO_3(aq) \rightarrow Fe(NO_3)_3(aq) + H_2O(I)$
- 17.  $CuSO_4(aq) + KI(s) \rightarrow CuI(s) + I_2(s) + K_2SO_4(aq)$

- 18.  $CaO(s) + H_2SO_4(aq) \rightarrow CaSO_4(s) + H_2O(g)$
- 19.  $BaO_2(s) + H_2SO_4(aq) \rightarrow BaSO_4(s) + H_2O_2(aq)$
- 20.  $PbCl_2(aq) + K_2SO_4(aq) \rightarrow PbSO_4(s) + KCl(aq)$
- 21.  $O_2(g) \rightarrow O_3(g)$
- 22.  $NH_3(g) + F_2(g) \rightarrow NH_4F(s) + NF_3(g)$
- 23.  $MnO_2(s) + A\ell(s) \rightarrow A\ell_2O_3(s) + 3Mn(s)$
- 24.  $SiC\ell_4(I) + Mg(s) \rightarrow Si(s) + MgC\ell_2(s)$
- 25.  $PbC\ell_2(aq) + K_2CrO_4(aq) \rightarrow PbCrO_4(s) + KC\ell(aq)$
- 26.  $H_2O(I) + Br_2(I) \rightarrow HBr(aq) + HOBr(aq)$
- 27.  $Mn(s) + S(s) \rightarrow MnS_2(s)$
- 28.  $ZnCl_2(aq) + Na_2CO_3(aq) \rightarrow ZnCO_3(s) + NaCl(aq)$
- 29.  $C_2H_6(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$
- 30.  $SO_{2}(g) + O_{2}(g) \rightarrow SO_{3}(g)$
- 31.  $A\ell(s) + H_2SO_4(aq) \rightarrow A\ell_2(SO_4)_3(aq) + H_2(g)$
- 32.  $C\ell_2(g) + KBr(aq) \rightarrow Br_2(I) + KC\ell(aq)$
- 33.  $Cr(s) + O_2(g) \rightarrow Cr_2O_3(s)$
- 34.  $MnS_2(s) + O_2(g) \rightarrow MnO_2(s) + SO_2(g)$

II.

- 1.  $SiO_2(s) + 2C(s) \rightarrow Si(s) + 2CO(g)$
- 2.  $CaC_2(s) + 2H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$
- 3.  $C\ell_2(g) + 2KI(aq) \rightarrow 2KC\ell(aq) + I_2(s)$
- 4.  $2Ag(s) + H_2S(g) \rightarrow Ag_2S(s) + H_2(g)$
- 5.  $3BaO(s) + 2A\ell(s) \rightarrow A\ell_2O_3(s) + 3Ba(s)$
- 6.  $4CO_{2}(g) + 2Na_{2}O_{2}(s) + 2H_{2}O(l) \rightarrow 4NaHCO_{2}(s) + O_{2}$
- 7. Balanced
- 8.  $3KBr(s) + H_3PO_4(aq) \rightarrow K_3PO_4(aq) + 3HBr(aq)$
- 9.  $CaH_2(s) + 2H_2O(l) \rightarrow Ca(OH)_2(aq) + 2H_2(q)$
- 10.  $PI_3(s) + 3H_2O(l) \rightarrow H_3PO_3(aq) + 3HI(g)$
- 11.  $2A\ell(s) + 3F_2(g) \rightarrow 2A\ell F_3$
- 12. Balanced
- 13. Balanced
- 14.  $2CaO(s) + 5C(s) \rightarrow 2CaC_2(s) + CO_2(g)$
- 15.  $PC\ell_5(s) + 4H_2O(l) \rightarrow H_3PO_4(aq) + 5HC\ell$
- 16.  $Fe_2O_3(s) + 6HNO_3(aq) \rightarrow 2Fe(NO_2)_2(aq) + 3H_2O(l)$
- 17.  $2CuSO_4(aq) + 4KI(s) \rightarrow 2CuI(s) + I_2(s) + 2K_2SO_4(aq)$
- 18.  $CaO(s) + H_2SO_4(aq) \rightarrow CaSO_4(aq) + H_2O(l)$
- 19. Balanced
- 20.  $PbCl_2(aq) + K_2SO_4(aq) \rightarrow PbSO_4(s) + 2KCl(aq)$
- 21.  $3O_2(g) \rightarrow 2O_3(g)$
- 22.  $2NH_2(g) + F_2(g) \rightarrow NH_4F(s) + NH_2F$
- 23.  $3MnO_2(s) + 4A\ell(s) \rightarrow 2A\ell_2O_2(s) + 3Mn(s)$
- 24.  $SiCl_4(l) + 2Mg(s) \rightarrow Si(s) + 2MgCl_2(s)$
- 25.  $PbCl_{3}(aq) + K_{2}CrO_{4}(aq) \rightarrow PbCrO_{4}(s) + 2KCl(aq)$
- 26. Balanced
- 27.  $Mn(s) + 2S(s) \rightarrow MnS_2(s)$
- 28.  $ZnCl_3(aq) + Na_2CO_3(aq) \rightarrow ZnCO_3(s) + 2NaCl(aq)$
- 29.  $2C_2H_6(g) + 7O_2(g) \rightarrow 4CO_2(g) + 6H_2O(g)$
- 30.  $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$
- 31.  $2A\ell(s) + 3H_sSO_s(aq) \rightarrow A\ell_s(SO_s)_s(aq) + 3H_s(q)$
- 32.  $C\ell_2(g) + 2KBr(aq) \rightarrow Br_2(l) + 2KC\ell(aq)$
- 33.  $4Cr(s) + 3O_2(g) \rightarrow 2Cr_2O_3(s)$
- 34.  $MnS_2(s) + 3O_2(g) \rightarrow MnO_2(s) + 2SO_2(g)$

## **Multiple Choice Questions**

1. d, 2. c, 3. b, 4. c, 5. c, 6. b, 7. d, 8. c, 9. d. 10. d

## Chapter 6. Electron Confi

## Electron Configuration and the Periodic Table

1. Valence electrons are found in the outermost shells. They determine the valence of the elements and hence, their chemical behaviour.

- 2. Similar types of shells are filled in the same way. Chemical properties of the members of a group are similar. They have the same number of electrons in their outermost shell.
- 3. a) 1
- b) 3
- c) 8

- d) 2
- 4. They may be located in the 5th shell or energy level. They have lower energy than the electrons in the other energy levels or shells.
- 5. a) 5

b) 7

c) 1

*d*) 3

6. a) S

- b) Cl
- c) Ca
- d) Li

7. a) F

b) N

- c) S
- d) Na
- 8. Metals lose electrons and become electropositive ions. Non-metals gain electrons and become electronegative ions.
- 9. Elements on the left of the Periodic Table lose electrons easily as they are generally metals and have a tendency to lose electrons to keep a stable outer shell.

10.

- a. They all exist as diatomic molecules.
- *b)* They are all non-metals.
- c) They have relatively high electronegativity.
- *d)* They form negative ions in combining with metals.
- 11. The number of valence electrons increases.
- 12. a) Sodium
- b) Fluorine
- 13. F, N, Be, Li
- 14. Ga, Mg, Ca, K
- 15. N (2, 5); P (2, 8, 5). Nitrogen will be more electronegative because its atoms have a small size due to which the attraction of its nucleus for the electron is greater.

16.

- a) Chemical activity first decreases and then increases.
- b) The oxides are metallic and basic at first and then the basic nature decreases. Then the oxides become non-metallic and the acidic nature increases.