Solutions : Quiz-50

1) Give definitions for each of the following terms.

a) solution

b) ionic compound

c) molarity

d) solubility

e) covalent bond

f) polar substance

2) Explain why ionic solutions will conduct electricity.

3)a) Write down the dissociation equation for $MgBr_2(s)$.

b) Write down the dissociation equation for $Al_2(SO_4)_3$

4) Find the concentrations in moles/liter.

a) 5.7 mol of KBr in 8.0 L of water.

b) 0.76 mol of NaCl in 550 mL of water.

c) 34 g of $MgCl_2$ in 1.4 L of water.

5) Find the concentration of all of the ions in 3.2 L of 0.80 M $Ca(NO_3)_2$

6) Find the volume of water required.

a) A 1.6 M solution contains 0.65 mol of solute.

b) A 0.82 M solution contains 48 g of KCl.

7) Find the number of moles required.

a) 4.1 L of a 0.37 M solution is required.

b) 350 mL of a 2.1 M Na_2SO_4 solution is required.

8) A solution is made by adding 30. mL of 0.72 M KCl with 40. mL of 1.5 M KCl. Find the final concentration.

9) A solution is made by mixing 250 mL of a 0.45 M NaCl solution with 320 mL of a 0.68 M $CaCl_2$. Find the final concentration of all ions.

10) Draw a picture of a water molecule. Show the charge at each end of the molecule.

11)a) Draw a neat picture of a glucose molecule.

b) Why is glucose soluble in water?

c) Explain why a glucose solution will not conduct electricity.

12) Which will conduct electricity; NaOH, or CH_3OH?

13) Explain what is meant by the statement; “Like dissolves like”.

14) Which will dissolve easily in benzene; a hydrocarbon, or an alcohol?

15) How would you increase the solubility of an ionic solid?

16) If 620 mL of a 0.85 M solution is diluted with 450 mL of water, find the new concentration.

17) The molarity of a solution is 4.2 M. When 50. mL of water was added, the new molarity was 3.8 M. Find the number of moles of solute.

Answers: 1)a) It is a homogeneous mixture., b) It is a compound composed of a metal and a non-metal., c) It is the concentration in mol/L., d) It is the concentration of a saturated solution. Or, it is the maximum concentration., e) It is the bond formed by a pair of shared electrons between two non-metallic atoms., f) It is a molecular compound with a charge at one end., 2) Ionic substances break apart into positive and negative ions., 3)a) $MgBr_2(s) \rightarrow Mg^{2+}(aq) + 2Br^-(aq)$, b) $Al_2(SO_4)_3(s) \rightarrow 2Al^{3+}(aq) + 3SO_4^{2-}(aq)$, 4)a) 0.71 M, b) 1.4 M, c) 0.25 M, 5) $[Ca^{2+}] = 0.80$ M, $[NO_3^-] = 1.6$ M, 6)a) 0.41 L, b) 0.78 L, 7)a) 1.5 mol, b) 0.74 mol, 8) 1.2 M, 9) $[Na^+] = 0.20$ M, $[Ca^{2+}] = 0.38$ M, $[Cl^-] = 0.96$ M, 10) see W.S.-40, 11)a) see W.S.-40, b) Glucose is soluble as it is a polar molecule., c) Glucose does not break apart into positive and negative ions., 12) NaOH, 13) In general, polar substances will dissolve in other polar substances, and non-polar substances will dissolve in other non-polar substances., 14) hydrocarbon, 15) Increase the temperature of the solvent., 16) 0.49 M, 17) 2.0 mol.