**Mixing of solutions**

**1.** 20 mL of 0.2M $Al_2(SO_4)_3$ is mixed with 30 mL of 0.6 M $BaCl_2$. Calculate the mass of $BaSO_4$ formed in solution.

$BaCl_2 + Al_2(SO_4)_3 \rightarrow BaSO_4 + AlCl_3$

**2.** 300 ml of 3.0 M NaCl solution is added to 200 ml of 4.0 M $BaCl_2$ solution. The concentration of $Cl^-$ ions in the resulting solution is

(A) 7 M (B) 6 M (C) 5.5 M (D) 5 M

**3.** What volumes should you mix of 0.2 M NaCl and 0.1 M $CaCl_2$ solution so that in resulting solution the concentration of positive ion is 40% lesser than concentration of negative ion. Assuming total volume of solution 1000 ml.

(A) 400 ml NaCl, 600 ml $CaCl_2$ (B) 600 ml NaCl, 400 ml $CaCl_2$

(C) 800 ml NaCl, 200 ml $CaCl_2$ (D) None of these

**4.** Assuming complete precipitation of AgCl, calculate the sum of the molar concentration of all the ions if 2 L of 2 M$Ag_2SO_4$ is mixed with 4 L of 1 M NaCl solution is

(A) 4 M (B) 2 M (C) 3 M (D) 2.5M

**5.** What approximate volume of 0.40 M $Ba(OH)_2$ solution must be added to 50.0 mL of 0.30 M NaOH solution to get a solution in which the molarity of the $OH^-$ ions is 0.50 M ?

(A) 33 mL (B) 66 mL (C) 133 mL (D) 100 mL

**6.** How many grams of sodium dichromate, $Na_2Cr_2O_7$, should be added to a 50.0mL volumetric flask to prepare 0.025 M $Na_2Cr_2O_7$ when the flask is filled to the mark with water ?

**7.** Calculate molarity of NaOH in a solution made by mixing 2 lit. of 1.5 M NaOH, 3 lit. of 2M NaOH and 1 lit. water.

**8.** How would you prepare exactly 3.0 litre of 1.0 M NaOH by mixing proportions of stock solution of 2.50 M NaOH and 0.40 M NaOH. No water is to be used. Find the ratio of the volume ($v_1/v_2$).

**9.** The concentration of $H_2SO_4$ in a solution which has a density 1.2 g /ml. and mass percent of $H_2SO_4$ is 9.8%, is

(A) 9.8 M (B) 1.2 M (C) 0.6 M (D) 1.8 M

**10.** What volume of 0.250 M$HNO_3$ (nitric acid) reacts with 50mL of 0.150M$Na_2CO_3$ (sodium carbonate) in the following reaction ?

$2HNO_3(aq) + Na_2CO_3(aq) \rightarrow 2NaNO_3(aq) + H_2O(l) + CO_2(g)$

**11.** 20 ml of 0.2 M $Al_2(SO_4)_3$ is mixed with 20 ml of 0.6 M $BaCl_2$. Concentration of $Al^{3+}$ ion in the solution will be

(A) 0.2 M (B) 10.3 M (C) 0.1 M (D) 0.25 M

**12.** 5 g of $K_2SO_4$ was dissolved in water to prepare 250 mL of solution. What volume of this solution should be used so that 2.33 g of $BaSO_4$ may be precipitated from $BaCI_2$ solution.

$K_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2KCl$

(A) 87 mL (B) 174 mL (C) 8.7 mL (D) 17.4 mL

**EUDIOMETRY**

**13.** $C_6H_5OH\ (g) + O_2\ (g) \longrightarrow CO_2\ (g) + H_2O\ (l)$

Magnitude of volume change if 30 ml of $C_6H_5OH$ (g) is burnt with excess amount of oxygen, is

(A) 30 ml (B) 60 ml (C) 20 ml (D) 10 ml

**14.** 10 ml of a compound containing 'N' and 'O' is mixed with 30 ml of $H_2$ to produce $H_2O$ ($l$) and 10 ml of $N_2$(g). Molecular formula of compound if both reactants reacts completely, is

(A) $N_2O$ (B) $NO_2$ (C) $N_2O_3$ (D) $N_2O_5$

**15.** When 20 ml of mixture of $O_2$ and $O_3$ is heated, the volume becomes 29 ml and disappears in alkaline pyragallol solution. What is the volume precent of $O_2$ in the original mixture?

(A) 90% (B) 10% (C) 18% (D) 2%

**16.** A mixture of $C_2H_2$ and $C_3H_8$ occupied a certain volume at 80 mm Hg. The mixture was completely burnt to $CO_2$ and $H_2O(l)$. When the pressure of $CO_2$ was found to be 230 mm Hg at the same temperature and volume, the fraction of $C_2H_2$ in mixture is

(A) 0.125 (B) 0.5 (C) 0.87 (D) 0.25

**17.** 20 mL of a mixture of CO and $H_2$ were mixed with excess of $O_2$ and exploded & cooled. There was a volume contraction of 23 mL. All volume measurements corresponds to room temperature (27°C) and one atmospheric pressure. Determine the volume ratio $V_1 : V_2$ of CO and $H_2$ in the original mixture

(A) 6.5 : 13.5 (B) 5 : 15 (C) 9 : 11 (D) 7 : 13

**18.** The % by volume of $C_4H_{10}$ in a gaseous mixture of $C_4H_{10}$, $CH_4$ and CO is 40. When 200 ml of the mixture is burnt in excess of $O_2$. Find volume (in ml) of $CO_2$ produced.

(A) 220 (B) 340 (C) 440 (D) 560

**COMPREHENSION**

A 10 ml mixture of $N_2$, a alkane & $O_2$ undergo combustion in Eudiometry tube. There was contraction of 2 ml, when residual gases are passed through KOH. To the remaining mixture comprising of only one gas excess $H_2$ was added & after combustion the gas produced is absorbed by water, causing a reduction in volume of 8 ml.

**19.** Gas produced after introduction of $H_2$ in the mixture ?

(A) $H_2O$ (B) $CH_4$ (C) $CO_2$ (D) $NH_3$

**20.** Volume of $N_2$ present in the mixture?

(A) 2 ml (B) 4 ml (C) 6 ml (D) 8 ml

**21.** Volume of $O_2$ remained after the first combustion?

(A) 4 ml (B) 2 ml (C) 0 ml (D) 8 ml

**22.** Identify the hydrocarbon.

(A) $CH_4$ (B) $C_2H_6$ (C) $C_3H_8$ (D) $C_4H_{10}$

# Answers

**1.** 2.79 **2.** (D) **3.** (D) **4.** (B) **5.** (A) **6.** 0.3275 **7.** 1.5 M **8.** 0.34 **9.** (B) **10.** 60 ml **11.** (A) **12.** (A) **13.** (B) **14.** (C) **15.** (B) **16.** (C) **17.** (D) **18.** (C) **19.** (D) **20.** (B) **21.** (C) **22.** (A)