VKT sir

Concentration terms

How many grams of solute should be added in 100 g water to get a solution of density 1.2 g/ml and strength 5% (w/v)?

(a) 5 g (b) 6 g
(c) 4.17 g (d) 4.35 g

Solute = x gm
H_2O = 100 gm
Soln = (x+100) gm
$\equiv \frac{x+100}{1.2}$ ml

% wt by volm
$= 5 = \frac{x}{\frac{x+100}{1.2}} \times 100$

$5x + 500 = 120x$
$x \simeq 4.35$ gm

An aqueous solution of glucose is 10% (w/v). The volume in which 1mole of glucose is dissolved, will be

(a) 18 l (b) 9 l
(c) 0.9 l (d) 1.8 l

$1\phi = \frac{180}{V(ml)} \times 100$

$V_{ml} = 1800$ ml
$= 1.8$ lit

The volume of water that must be added to a mixture of 250 ml of 0.6 M HCl and 750 ml of 0.2 M HCl to obtain 0.25 M solution of HCl is:

(a) 750 ml (b) 100 ml (c) 200 ml (d) 300 ml

c

$0.6 \times 250 + 0.2 \times 750 = 0.25(250 + 750 + V)$

$V = 200$ ml

What approximate volume of 0.40 M $Ba(OH)_2$ must be added to 50.0 mL of 0.30 M NaOH 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

75 m1 of H_2SO_4 (specific gravity is 1.18) containing 1 49% H_2SO_4 by mass is diluted to 590 ml. Calculate molarity of the diluted solution. [S = 32]

(a) 0.7 M (b) 7.5 M (c) 0.75 M (d) 0.25 M

c

$x \times 590 = \frac{0.5}{\frac{100}{1.18}} \times 75 \times 1000$

$x = 0.75\ M$

Soln = 100 gm $\equiv \frac{100}{1.18}$ ml

H_2SO_4 = 49 gm = 0.5 mole

What is the molarity of H_2SO_4 solution that has a density of 1.84 g/cc and contains 98% by mass of H_2SO_4?

(a) 4.18 M (b) 8.14 M (c) 18.4 M (d) 18 M

c

Soln = 100 gm $\equiv$ (100/1.84) ml

H_2SO_4 = 98 gm = 1 mole

$M = \frac{1}{\frac{100}{1.84} \times \frac{1}{1000}} = 18.4$

The concentration of an aqueous HCl solution is 70% (w/v) with density equal to 1.17 g/mL. The molarity of the solution will be:

(a) 36.5 (b) 18.25 (c) ~~22.05~~ 19.17 (d) 4.65

c

Soln = 100 ml $\equiv$ 117 gm

HCl = 70 gm $\equiv \frac{70}{36.5}$ mole

Solvent = 117 − 70 = 47 gm

$M = \frac{70}{36.5 \times 0.1} = 19.17$

$\text{molality} = \frac{70}{36.5 \times \frac{47}{1000}} = 40.8$

The molarity of Cl^- in an aqueous solution which was (W/v) 2% NaCl, 4% $CaCl_2$ and 6% NH_4Cl will be:

(a) 0.342 (b) 0.721 (c) 1.12 (d) 2.18

d

Density of a 3 molar aqueous solution of $Na_2S_2O_3$ is 1.482 gm/ml. Calculate mole fraction of $Na_2S_2O_3$ in solution.

(a) 0.054 (b) 0.06 (c) 0.03 (d) 0.072

a

120 gm of glucose is dissolved to make 1 litre solution having density 1.2 g mL^{-1}. Which of following is correct about the solution?

(a) Molarity of solution is 2 M (b) Solution is 10% w/w

(c) Solution is 10% w/v (d) Molality of solution is 1.85 molal

b

What volume of 95% H_2SO_4 by weight ($d_{solution}$ = 1.85 g/ml) must be taken to prepare 100 ml of 15% (w/w) solution of H_2SO_4 ($d_{solution}$ = 1.1 g/ml)?

(a) 9.4 ml (b) 18.8 ml (c) 128.2 ml (d) 56.4 ml

a