

PROBLEMS BASED ON CONCENTRATION OF SOLUTIONS	
1.	A solution is prepared by adding 2g of a substance A to 18g of water. Calculate m/m%.
2.	What is the mass percent of 5g of solute dissolved in 50g of water?
3.	A sample of drinking water was found to be contaminated with chloroform. The level of concentration was 15 ppm. Express this in percent by mass. Also determine the molality of chloroform in the water sample.
4.	Calculate the mass of sodium acetate required to make 500 ml of 0.375 M aqueous solution.
5.	0.38 g of NaNO_3 is placed in a 50 ml measuring flask. The flask is filled with water up to the mark on the neck. What is the molarity of the solution?
6.	Calculate the concentration of nitric acid in moles per litre in a sample which has density 1.41g/ml and mass percent of nitric acid in it is 69%.
7.	What is the concentration on cane sugar in mol/L if 20 g of it is dissolved in enough water to make a final volume of 2 L?
8.	If density of methanol is 0.793 kg/L, what is its volume needed for making 2.5 L of its 0.25 M solution?
9.	Calculate molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.25.
10.	What mass of CaCO_3 is required to react completely with 25 mL of 0.75 M HCl?
11.	The density of 3 M solution of NaCl is 1.25 g/ml. Calculate the molality of the solution.
12.	Calculate the number of oxalic acid molecules in 100ml of 0.02 M oxalic acid solution.
13.	How much of a 15.0 M stock solution do you need to prepare 250 ml of a 2.35 M HF solution?
14.	If 455 ml of 6.0 M HNO_3 is diluted to 2.5 L, what is the molarity of the diluted solution?
15.	What volume of oxalic acid, $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ of strength 0.125 M is required to neutralize 25 ml of 0.1 M NaOH?
16.	Concentrated phosphoric acid is 90% H_3PO_4 by mass and the remaining mass is water. The molarity of H_3PO_4 in 90% H_3PO_4 is 12.2 M at room temperature. a. What is the density of this solution at room temperature? b. What volume (in mL) of this solution is needed to make a 1.00 L solution of a 1.00 M phosphoric acid?
17.	Commercially available concentrated hydrochloric acid is 38% HCl by mass. If its density is 1.1 g/cm ³ , calculate molarity, molality of the solution and also the mole fraction of HCl.
18.	Concentrated H_2SO_4 is 98% by mass and has a density of 1.84 gcm ⁻³ . What volume of the concentrated acid is required to make 5 L of 0.5 M H_2SO_4 solution?
19.	What is the concentration of sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) in mol L ⁻¹ if its 20g are dissolved in enough water to make a final volume up to 2 L?
20.	Calculate the mass of sodium acetate (CH_3COONa) required to make 500 mL of 0.375 molar aqueous solution.