

- 1) How will you make a 2.30 kg of a solution that is 4.85% NaNO_3 by mass? (ans: 112g NaNO_3 +2.19 kg water)
- 2) What is the mass percent of solute in each of the following solutions?
- a) 175 mg NaCl /g solution (ans: 17.5%)
- b) 0.275 L methanol ($d=0.791$ g/mL)/Kg water. (ans:17.9%)
- 3) What is the mass percent of solute in each of the following solutions?
- a) 4.12 g NaOH in 100.0 g water. (ans: 3.96%)
- b) 5.00 mL ethanol ($d = 0.789$ g/mL) in 50.0 g water. (ans:7.31%)
- 4) What is the volume percent of the following solutions? Assume the volumes are additive.
- a) 58.0 mL water in 625 mL of ethanol-water solution. (ans: 9.28%)
- b) 10.00 g methanol ($d = 0.791$ g/mL) in 75.00 g ethanol ($d = 0.789$ g/mL). (ans: 11.7%)

- 5) Express the following solutions in the units indicated:
- 1 μg benzene/L water as ppb benzene. (ans: 1ppb)
 - 0.0035% NaCl by mass as ppm NaCl. (ans: 35ppm)
- 6) Calculate the molality of a solution that has 1.02 Kg sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{12}$ MW = 342.3 g/mol) in 554 g water. (ans: 5.38m)
- 7) An aqueous solution is prepared by diluting 3.30 mL acetone (CH_3COCH_3 ; $d = 0.789$ g/mL, MW = 58.08g/mol) with water to a final volume of 75.0 mL. The density of the solution is 0.993 g/mL. What are the molarity and molality of the solution? (ans: 0.598M, 0.624m)
- 8) What is the mol fraction of naphthalene (C_{10}H_8 , MW 128.16g/mol) in a solution of:
- 23.5 g naphthalene in 315 g benzene (C_6H_6 , MW 78.11 g/mol)? (ans: 0.0434)
 - A 0.25 m solution of naphthalene in benzene. (ans: 0.0192)