EXTRA PROBLEMS – UNIT 3

1. Calculate the concentration, as mass-volume percent cesium chloride (CsCl), for a solution prepared by adding 5.09 g of CsCl to 20.0 g of water to give a solution with a density of 1.18 g/mL. (molar mass CsCl = 168.36 g/mole)

2. The density of a 2.019 M sodium bromide, NaBr, solution is 1.157 g/mL. What is the concentration of this solution expressed as % (m/m) NaBr? (molar mass NaBr = 102.9 g/mole)

3. How many grams of water must be added to 80.0 g of sodium chloride to prepare a solution that is 1.3475 m NaCl? (molar mass NaCl = 58.44 g/mole)

4. The density of a 60.00 % (m/m) ethanol, C_2H_6O, solution is 0.8937 g/mL. What is the molarity of the solution? (molar mass C_2H_6O = 46.07 g/mole)

5. The density of a 2.687 M sodium acetate solution is 1.104 g/mL. What is the concentration of this solution expressed as % (m/m) $NaC_2H_3O_2$? (molar mass $NaC_2H_3O_2$ = 82.03 g/mole)

6. An aqueous solution of citric acid, $H_3C_6H_5O_7$, is 0.655 M and has a density of 1.049 g/mL. What is the molality of the solution? (molar mass $H_3C_6H_5O_7$ = 192.13 g/mole)

7. An aqueous solution of tartaric acid, $H_2C_4H_4O_6$, is 0.278 m and has a density of 1.006 g/mL. What is the molarity of the solution? (molar mass $H_2C_4H_4O_6$ = 150.09 g/mole)

8. Calculate the molality of a 23.0% by mass acetic acid, $HC_2H_3O_2$, solution. (molar mass $HC_2H_3O_2$ = 60.05 g/mole)

9. The concentration of a $Pb(NO_3)_2$ solution is 0.953 m and 0.907 M. What is the density of the solution, in grams per mL? (molar mass $Pb(NO_3)_2$ = 331.21 g/mole)