CH 222 Exam Prep II Worksheet Name: _____

Worksheet due dates: **Mon, 2/23, 1:10 PM** *(L1)* **, Wed, 2/25, 1:10 PM** *(L2)* ***or*** **Fri, 2/27, 1:10 PM** *(L3)*. To complete, show ***detailed steps*** on how to get the given answer for each problem. *Failure to use this form for work and answers will result in a point penalty.*

Problem 1: Lauryl alcohol is obtained from coconut oil and is used to make detergents. A solution of 5.00 g of lauryl alcohol in 100. grams of benzene freezes at 4.1 °C. What is the molar mass of lauryl alcohol? (for benzene, k_{fp} = 5.12 °C/m; normal freezing point of benzene = 5.5 °C)

Answer to Problem #1: **180 g/mol**

Problem 2: How much energy is needed to convert 64.0 g of ice at 0.00 °C to liquid water at 75.0 °C? Note that the Heat of fusion for water = 333 J/g.

Answer to Problem #2: **41.4 kJ**

Problem 3: Concentrated nitric acid is 70.0% by mass HNO_3 in water. The density of this acid is 1.42 g/cm^3. What is the molarity of the acid? State any assumptions you make while solving this problem.

Answer to Problem #3: **15.8 M**

Problem 4: A 5.50 g sample of a compound is dissolved in 250. g of benzene. The freezing point of this solution is 1.02 °C below that of pure benzene. What is the molar mass of the compound? (k_f for benzene = -5.12 °C/m)

Answer to Problem #4: **110. g/mol**

Problem 5: Polyethylene is a synthetic polymer or plastic with many uses. 1.40 g of a polyethylene sample was dissolved in enough benzene to make 100. mL of solution, and the osmotic pressure was found to be 1.86 torr at 25 °C. What is the molar mass of the polyethylene?

Answer to Problem #5: **$1.40 * 10^5$ g/mol**