CHM 152LL
Lab Report

The Determination of K_f —Freezing Point Depression Constant for Glacial Acetic Acid

Name _____

Partner _____

Data Table:

Mass of test tube + weighing beaker		
Mass of glacial acetic acid & test tube + weighing beaker		
Mass of glacial acetic acid		
Freezing point of pure glacial acetic acid	Trial 1:	Trial 2:
	Average =	
Mass of glacial acetic acid & test tube + weighing beaker (Step 10)		
Mass of glacial acetic acid + H_2O & test tube + weighing beaker (Step 11)		
Mass of H_2O (1^{st} sample)		
Freezing point of 1^{st} sample of water in glacial acidic acid solution	Trial 1:	Trial 2:
	Average =	
Mass of glacial acetic acid + 1^{st} H_2O & test tube + weighing beaker (Step 13)		
Mass of glacial acetic acid + 2^{nd} H_2O & test tube + weighing beaker (Step 14)		
Mass of H_2O (1^{st} and 2^{nd} combined)		
Freezing point of combined sample of water in glacial acidic acid solution	Trial 1:	Trial 2:
	Average =	

Calculations for Kf:

I. For the solution of water in glacial acetic acid after the 1st addition of water,

a) what is the molality of the solutions?

b) what is the ΔT_f of the solution?

c) what is Kf determined based on the above data?

II. For the solution of water in glacial acetic acid after the 2nd addition of water,

a) what is the molality of the solutions?

b) what is the ΔT_f of the solution?

c) what is Kf determined based on these data?

III. Do the Kf values calculated above agree well? Why? Why not?

Questions:

1. Look up references that you can find in Library's or the Internet on supercooling and give a summary of your understanding of this phenomena from a molecular perspective.

2. Our temperature probe has a lower temperature limit of $-5\ ^{o}C$. Based on the K_f value that you obtained, what is the maximum mass of water that can be added to glacial acetic acid for our laboratory situation.