

CHM 1046 Final Exam Review notes ①

i) Determination the Molecular mass of the unknown substance from Freezing Point.

1) Change in freezing temperature (ΔT_f) $^{\circ}\text{C}$

2) molality (m) of unknown solution

3) moles of unknown sample

4) Molecular mass of unknown sample, g/mole

ii) molar heat of fusion of ice

1) mass warm water, g

2) mass ice, g

3) $\Delta t^{\circ}\text{C}$ of "warm" body, $^{\circ}\text{C}$

4) $\Delta t^{\circ}\text{C}$ of "cool" body, $^{\circ}\text{C}$

5) q lost by "warm" body, J

6) q gained by "cool" body, J

7) $\Delta H_{\text{fusion}} / \text{g ice}$, J/g

8) $\Delta H_{\text{fusion}} / \text{mole ice}$, J/mole

III) Determination the rate Law for the reaction (2)

- 1) Determine the rate of reaction for Trials 1-3 and the relative rates
- 2) Determine the order of reaction with respect to:
 - $H_2C_2O_4$
 - $KMnO_4$
- 3) Overall reaction order
- 4) Determine the rate Law for the reaction
- 5) Calculate rate constant (k), including the correct units.

IV) Determination the Solubility product
 K_{sp} for Ag_2CrO_4 .

- 1) Determine the concentration of $[CrO_4^{2-}]$ from graph.
- 2) Calculate value of K_{sp} Ag_2CrO_4

③

V) Determination the Acid Dissociation Constant (K_a) for the weak acid.

1) From the midpoint of the "step" determine the Volume of the base needed to neutralize the acid.

2) Volume at $\frac{1}{2}$ neutralization

3) pH at $\frac{1}{2}$ neutralization

4) K_a of unknown acid

$$K_a = [H_3O^+] = 10^{-pH} \text{ at } \frac{1}{2} \text{ neutralization}$$