

CHEM 113••EXAM #2 Spring 2005

•• <u>Intermolecular Forces (Chapter 10)</u> General types and magnitudes Relationship to bp, fp, vapor pressure, solubility, etc	5
• <u>Phases Changes and Energy of these Changes (Chapter 10)</u> Using phase diagrams, states of matter, understanding heat relationships and calculations for warming and cooling processes	5
• <u>Colligative Properties(Chapter 11)</u> Influence of solutes on various properties of solvents Calculate these effects	5
• <u>General Kinetics Terms (Chapter 12.1 – 12.3)</u> General definitions (such as average rate, rate law, etc.)	3
• <u>Differential Rate Laws (Chapter 12.1-12.3)</u> Determination of k, orders of reactants, relative rates	5
• <u>Integrated Rate Laws and Theory(Chapter 12.4-12.8)</u> Determination of k, orders of reactants, relative rates	4
TOTAL	27

Constants:

$$1 \text{ mole} = 6.022 \times 10^{23} \text{ units}$$

$$R = 0.0821 \frac{\text{L atm}}{\text{mole K}} = 8.314 \frac{\text{J}}{\text{mole K}}$$

$$1 \text{ atm} = 760 \text{ torr} = 760 \text{ mmHg}$$

$$1 \text{ L} \cdot \text{atm} = 101 \text{ J}$$

$$1 \text{ cm}^3 = 1 \text{ mL}$$

Constants for water

$$K_b \text{ for water} = 0.52^\circ \text{C/m} \quad K_f \text{ for water} = 1.86^\circ \text{C/m}$$

$$\text{Spec. Heat Capacity of H}_2\text{O (l)} = 4.18 \text{ J/g}^\circ\text{C}$$

$$\text{Density of H}_2\text{O (l)} = 1.00 \text{ g/mL}$$

$$\Delta H_{\text{vap}} (\text{H}_2\text{O}) = 40.7 \text{ kJ/mole at } 100^\circ\text{C}$$

Colligative Properties Formulas:

$$\Delta T_f = m_T K_f$$

$$\Delta P_A = X_T P^\circ_A$$

$$\Delta T_b = m_T K_b$$

$$\Pi = M_T RT \quad P_A = X_A P^\circ_A$$

Kinetics Formulas:

$$A_t = A_0 \exp(-kt) \quad \ln(A_t) = -kt + \ln(A_0) \quad A_t = A_0 - kt \quad \frac{1}{A_t} = \frac{1}{A_0} + kt$$

Various Heat Capacities, and Constants, Plus a Periodic Table.

Bring #2 Pencils, Calculators, and Yourself.