CH 222 Chapter Twelve Study Guide

- Be able to explain the concept of <u>reaction rate</u>.

- Be able to derive the <u>average</u> and <u>instantaneous rate</u> from experimental information.

- Know the possible conditions that might affect reaction rate (such as reactant concentrations, temperature, presence of a catalyst, etc.)

- Know how to use a <u>rate equation</u>, and know how to find the <u>rate constant</u> and <u>order of reaction</u> from such an equation. Be able to derive a rate equation from experimental data.

- **MEMORIZE** the relationships between reactant concentration and time for <u>zero order</u>, <u>first order</u> and <u>second order</u> reactions. Know the integrated rate laws for these relationships.

- Know how to apply <u>graphical techniques</u> for determining the rate or reaction, reaction order and the rate constant.

- Be able to use the idea of <u>half-life</u> in kinetic equations.

- Know the principles behind the collision theory of reaction rates.

- Memorize the <u>Arrhenius equation</u>; be able to calculate the <u>activation energy</u> from experimental data.

- Be able to comprehend the concept of the <u>reaction mechanism</u>. Know how the mechanism relates to the overall stoichiometric equation for a reaction.

- Be able to describe the <u>elementary steps</u> of a mechanism and give their <u>molecularity</u>.

- Know how to find the <u>rate-determining step</u> in a mechanism and describe any reaction intermediates.

- Describe the role of the <u>catalyst</u> in reactions; know how it affects the activation energy and mechanism of a reaction. Understand the difference between a <u>homogeneous</u> and <u>heterogeneous</u> catalyst.

- Be able to solve and understand the assigned problems in problem set #6.