Study Guide for Exam #1 (Ch. 1-3)

Chem20, Elementary Chemistry

MEMORIZE:

- All metric prefixes on the handout (Giga, Mega, kilo , deci, centi, milli, micro, nano, pico)
- Density = $\frac{\text{mass}}{\text{volume}}$
- 1 mL = 1 cm^3
- K = 273.15 + °C
- $q = m \cdot C_s \cdot \Delta T$ [heat = mass x specific heat capacity x change in temperature]

Examples taken from Tro's Introductory Chemistry, 6th edition

Chapter One: The Chemical World

I. The Scientific Method (1.3): Know the order and definitions of each step of the Scientific Method and be able to match descriptions to the steps.
Examples, Ch. 1: 7-10, 15-16

Chapter Two: Measurement and Problem Solving

I. Scientific Notation (2.1): Know how to convert numbers in and out of scientific notation.
Examples, Ch. 2: 31-34, 39-40

II. Significant Figures (2.3-2.4): Know how to count and/or round to the significant figures in a number. Know how to round multistep calculations to appropriate significant figures. *Examples, Ch. 2: 45-46, 49-68*

III. Units of Measurement (2.5): Know your metric prefixes and how to convert between them.
Examples, Ch. 2: 69-80

IV. Dimensional Analysis (2.6-2.8): Know how to use dimensional analysis to solve conversion problems, particularly word problems. Be able to perform conversions with units raised to a power (squared, cubed).
Examples, Ch. 2: 81-94, 113-116

V. Density (2.9): Know how to use the equation to determine the density, volume, or mass of an object when given the other two.
Examples, Ch. 2: 99-116

Chapter Three: Matter and Energy

I. Classifying Matter (3.4): Know how to classify matter by its composition into pure elements, pure compounds, homogeneous mixtures, or heterogeneous mixtures.
Examples, Ch. 3: 31-36

II. Classifying Properties and Changes (3.5-3.6): Know how to differentiate between physical or chemical properties and physical or chemical changes.
Examples, Ch. 3: 37-44

III. Energy and Temperature (3.8-3.10): Know how to identify the appropriate equations to allow the conversion between units of energy and units of temperature when given a list of possibilities.
Examples, Ch. 3: 51-56, 65-74

IV. Heat Capacity and Temperature Changes (3.11-3.12): Know how to calculate heat, mass, specific heat capacity, or change in temperature when given the other three.
Examples, Ch. 3: 75-100