

Study Topics for Exam 1

Lecture 1: Characterization of Materials

- Chemical and Physical Processes
- Chemical and Physical Properties
 - Intensive vs. Extensive Physical Properties
- Tabulations of the Properties
 - CRC Handbook of Chemistry and Physics, Merck Index, Wikipedia, etc.

Lecture 2: Measurements - Error

- Accuracy vs. Precision
- Systematic, Random and Gross Error
- Percentage Error

Lecture 3: Measurements - Precision

- Terminology
 - Gradation, Uncertainty, Resolution, Precision
- Significant Figures
 - Definition
 - Handling Zeros
 - Exact Numbers
- Propagating Through Calculations
 - Rounding Numbers (ASTM Guidelines)
 - Addition and Subtraction
 - Multiplication and Division
 - Multiple Operations

Lecture 4: Measurements - Large and Small Numbers

- Powers of Ten Video
- Scientific Notation
 - Definition
 - Handling Addition and Subtraction
 - Handling Multiplication and Division

Examples of Questions

- Which of the following is a chemical property?
 - An Iron nail is attracted to a magnet.
 - A Silver spoon is tarnished in air.
 - Ice floats on liquid Water.
 - Hammering Gold into very thin Gold Leaf.
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- Lavoisier was the first chemist to determine the percentage oxygen in the atmosphere. He determined the atmosphere is (1/6) oxygen. Current measurements put the percentage closer to (1/5). What is the percentage error in Lavoisier's determination?