

Study Topics for Exam 2

Lecture 5: Unit Standards

- Quantities to Be Measured and Units of Measurement
- Rationale for Having Unit Standards
 - Magna Carta, US Constitution
 - Mars Orbiter
 - Ancien Regime Units
- Origin of the Metric System
- SI* Unit Standards
 - The Meter
 - Provisional Meter
 - Surveying the Meter
 - 1799 Meter
 - 1875 Meter, 1963 Meter, 1983 Meter
 - The Kilogram
 - Others
 - Second, Kelvin, Mole, Ampere, Candela

Lecture 6: Unit Conversions

- Metric Divisions
 - Metric Prefixes
 - Metric Unit Conversions
- Non-Metric Conversions
 - Exact Conversion Factors
 - Measured Conversion Factors

Lecture 7: Odds and Ends

- Mass vs. Weight
- Temperature Scales
- Dimensional Analysis
 - Examples
 - Density
 - Density, Volume, Mass Calculations

Lecture 8: Science of Separations

- Review of Properties of Matter
 - Chemical and Physical Properties
 - Discovery of Iridium and Osmium
- Matter
 - Heterogeneous and Homogeneous Systems
 - Many Examples

- States of Matter
 - Solid, Liquid, Gas, Plasma, Bose-Einstein Condensate
 - Colloidal Systems
 - Amorphous Solids
- Separation of Heterogeneous Systems
 - Filtration
 - Gravity and Buchner Funnels
 - Separatory Funnel
- Discovery of the Rare Earth Elements

Lecture 9: Science of Separation cont'd

- Solutions vs. Pure Substances
 - Properties of Solutions
- Separation Techniques
 - Distillation
 - General Procedure
 - Distillation of Alcohol
 - Crude Oil Refining
 - Chromatography
 - How it Works
 - Types of Chromatography
 - Paper, Thin Layer, Column
- Compounds vs. Elements
 - Lavoisier's Demonstration of the Compound Nature of Water

Lecture 10: Elemental Substances

- Elements Known to Ancients
- Discovery of Phosphorus
- Lavoisier's Table of Elements
- Discovery of Elements
 - Remind about Platinum and Iridium, Rare Earths
 - The Work of the Currie's
 - Radioactive Elements
 - Super Heavy Elements
- Naming of the Elements
- Allotropes
- Classification of the Elements
 - Metals, Metalloids, non-Metals
 - Physical State
 - Chemical Groups