

Unit 1: The Nature of Matter

1.1 Elements and the Periodic Table

- Definitions to know (use your textbook)
 - Element
 - Compound
 - Metals
 - SATP
 - STP
 - Empirical definition
 - Nonmetals
 - Metalloids
 - Group
 - Period
 - Periodic Table
 - Staircase
 - Alkali metals
 - Alkaline earth metals
 - Noble gases
 - Halogens
 - Representative elements
 - Transition metals
 - Lanthanides
 - Actinides
 - Transuranic elements

Naming Elements

- Just over 100 known elements.
- Use symbols: upper case letter possibly followed by a single lower case letter.
- Symbols developed by Berzelius.
- Today The International Union of Pure and Applied Chemists
- Many chemical names are derived from Latin. (argentum = silver = Ag)

Organizing the Elements

- Relative atomic mass → carbon is 12 times heavier than hydrogen
- Dobereiner: first to use trends to classify elements
- Newlands: organized elements based on atomic mass and noticed repeating patterns and called them families

Mendeleev's Periodic Table

- Father of the modern day periodic table.
- Organized elements using the first periodic law: elements arranged in order of increasing atomic mass show a periodic recurrence of properties at regular intervals.
- What does this law mean? There are groups of elements with similar properties equally spaced apart (families on the periodic table).
- Called these similarities, trends.
- From his table he was able to predict the existence of yet to be discovered elements. See table 3 on page 16 for a comparison between his predictions and the discovery of Germanium.

The Modern Periodic Table

- Figure 7 on page 17 shows the periodic table as it truly is, but we are more familiar with the condensed version found on page 18.
- Modern Periodic Law: When the elements are arranged in order of increasing atomic number, their properties show a periodic recurrence and gradual change.

Names of Groups and Series of Elements

- Memorize page 19.

Homework

- Practice Questions: 1, 2, 3, 4 (2 products only), 7, 9, 11, 12, 17, 18, 19
- Section Questions: 1, 2, 4
- Student Worksheet 1.1c