Chemistry: Form Ls3.1A Name _____

PERIODIC TABLE Date _____ Period _____

Development of the Periodic Table

Aim

- describe how elements are arranged on the Periodic Table
- state the Periodic Law

Notes

Definitions

- Classification - grouping elements based on similarities
- Cross Classification - classifying into more than one group at a time
  - Examples
    - Deck of cards – Suits and Numbers
    - Periodic Table – Groups or Families and Periods
  - Purpose - organize, explain, and predict information about the elements

History

- Mendeleev's Periodic Table
  - Dmitri Mendeleev (1869) prepared a card for each of the known elements listing the
    - symbol
    - atomic mass
    - chemical properties
      - very active metal - loses electrons very easily
      - active metal - loses electrons easily
      - metal - loses electrons
      - metalloid - gains or loses electrons
      - nonmetal - gains electrons
      - active nonmetal - gains electrons easily
      - very active nonmetal - gains electrons very easily
    - He arranged the cards in order of increasing atomic mass and noticed a pattern:
      - MENDELEEV'S PERIODIC LAW: When the elements are arranged in increasing order of atomic mass, the chemical properties repeat themselves periodically.
    - Mendeleev moved the card of the second and third very active metal, etc., by the card of the first very active metal, keeping the cards in order of mass.
      - The cards thus arranged formed groups or families with similar properties.
      - this arrangement forms the basis for the first Periodic Table
- Moseley's Periodic Table (Modern Periodic Table)
  - Moseley noticed that when all the elements were arranged in order of mass a few were not in the right family with respect to properties
  - Moseley used a procedure called X-ray diffraction to determine the atomic number of the elements.
  - When the elements were arranged in increasing order of atomic number, the discrepancies in Mendeleev's table disappeared.
  - THE PERIODIC LAW: When the elements are arranged in increasing order of atomic number, the chemical properties repeat themselves periodically.
  - The modern Periodic Table is arranged in order of increasing atomic number.

Answer the questions below by circling the number of the correct response

1. In the Periodic Table, the elements are arranged in order of increasing
   (1) atomic size (3) atomic number
   (2) atomic mass (4) ionization energy

2. The chemical properties of the elements are Periodic functions of their atomic
   (1) spin (3) isotopes
   (2) mass (4) number

3. Which pair contains elements which have the most similar chemical properties?
   (1) Mg and Ca (3) N and S
   (2) H and Li (4) Na and Cl

4. The element with an atomic number of 34 is most similar in its chemical behavior to the element with an atomic number of
   (1) 19 (3) 31

5. Silicon is most similar in chemical activity to
   (1) carbon (3) lead
   (2) sulfur (4) nitrogen