



How did Mendeleev arrange the elements in the periodic table? How did Moseley arrange the elements in the periodic table?

TYPES OF ELEMENTS

- A. Metals –Left Side of the PT
- B. Nonmetals – Right Side of the PT
- C. Metalloids – Along the *Staircase*.

Representative Elements:

- + Name given to the first 2 columns (H & Be) and the last 6 columns (B, C, N, O, F, He)

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REGIONS ON THE PERIODIC TABLE

Metals Metalloids Nonmetals

What are the different metallic groups on the periodic table?

PROPERTIES OF METALS

Metals: Most elements are metals. Metals are in solid state, except Mercury (it is in the liquid state at room temperature).

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I. Properties of Metals

- A. Good conductors of heat and electricity
- B. Malleable (can be hammered into thin sheets)
- C. Ductile (can be pulled into wires)
- D. Lustrous (shiny appearance)
- E. Ion Formation - Lose electrons; Form cations (positively charged ions)

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GROUP NAMES

What are the different metallic groups on the periodic table?

ALKALI METALS

A. Alkali Metals (Group 1)

- 1) Examples: Li, Na, K, Rb, Cs, Fr
An Exception: H (a nonmetal) is NOT an alkali metal even though it shares similar chemical properties
- 2) Soft – can be cut with a knife
- 3) Very reactive
- 4) Valence electrons? 1
- 5) Form ions with a charge of 1^+ .
- 6) Uses: Detergents, fertilizer, explosives, water softening, research

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ALKALI METALS

STUDENT PRESENTATION

Na & K

What are the different metallic groups on the periodic table?

ALKALINE EARTH METALS

B. Alkaline Earth Metals (Group 2)

- 1) Examples: Be, Mg, Ca, Sr, Ba, Ra
- 2) Less reactive than Alkali metals
- 3) Valence electrons? 2
- 4) Form ions with a charge of $2\pm$.
- 5) Uses: construction (Ca: marble & limestone; Mg: airplanes), body function (Mg activates enzymes) & skeletons (Ca: bones), medicines (Ba: the "GI cocktail")

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ALKALINE EARTH METALS

STUDENT PRESENTATION

Ca & Mg

What are the different metallic groups on the periodic table?

TRANSITION METALS

C. Transition Metals (Groups 3–12)

- 1) Examples: Cu, Fe, Ag, Pt, Au, Hg
- 2) Fairly Unreactive
- 3) Form Colored Compounds
- 4) Forms Cations with 1+ to 7+ Charge
- 5) Uses: Jewelry (Pt, Au, Ag), body chemistry (Fe, Co, Cu, & Mn), plumbing & electrical wiring (Cu), thermometers (Hg), light bulb filaments (W)

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TRANSITION METALS

STUDENT PRESENTATIONS

Cr, Mn, & Fe

Cu, Ag, & Au

Zn, Cd, & Hg

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RARE EARTH METALS

D. Rare Earth Metals

- 1) Examples: Lanthanides (58 - 71)
Actinides (90 - 103)
- 2) Most have Radioactive Isotopes
- 3) Elements with $Z > 92$ are Man-Made (Synthetic)
- 4) Forms Cations with 2+ to 6+ Charge
- 5) Uses: Glow-in-dark paint (Pm), nuclear reactors (U), strong magnets & lasers (Nd), smoke detectors (Am), portable x-ray machines (Sm)

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RARE EARTH METALS

HUNTING THE ELEMENTS
(NEODYMIUM)

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ALLOYS

III. Alloys

A. Definition: A homogeneous mixture of two or more elements, at least one of which is a metal, and where the resulting material has metallic properties.

B. Examples:

- 1) Brass (Copper & Zinc)
- 2) Bronze (Copper & Tin)
- 3) Steel (Iron & Carbon)
- 4) Gold [Bonus Example]:
 - a) Yellow Gold: Gold & Copper
 - b) White Gold: Gold & Silver
 - c) Rose Gold: Gold & Nickel

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ORES (ADD AFTER ALLOYS)

IV. Ores

+ Definition: Minerals containing metal compounds.

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