The Periodic Table

A work of art!

Pg 184

The Periodic Table

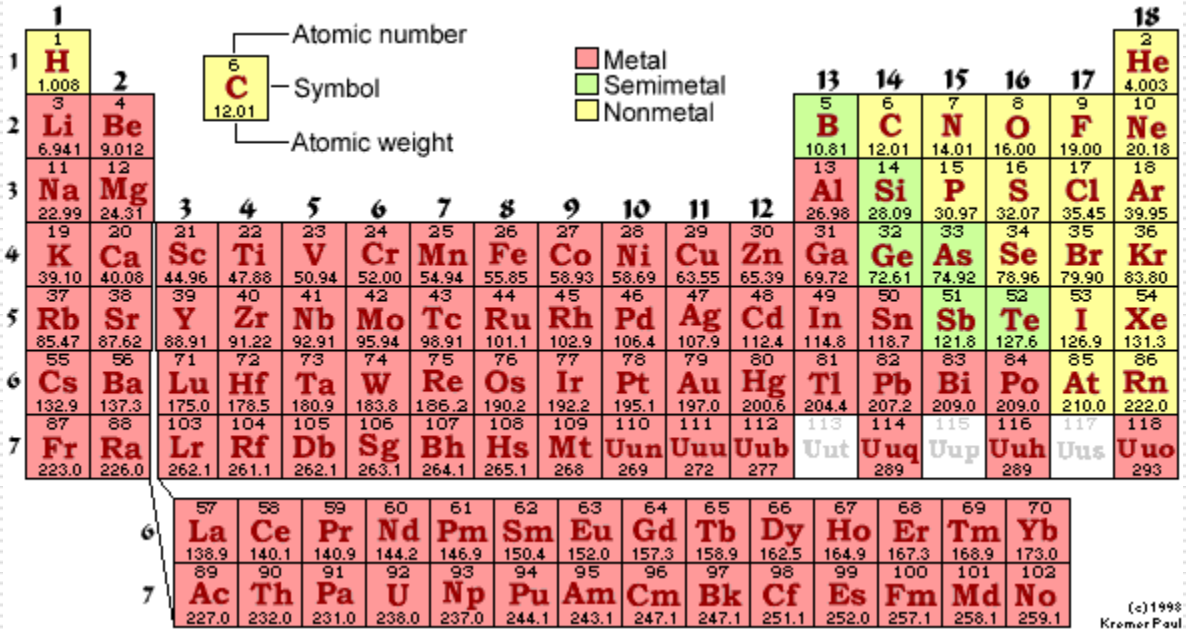
- Columns are called groups, or families
- Rows are called periods
- Elements are arranged according to atomic number (# protons)

Periods

- A new row means a new electron orbit
- The end of the row means a full outer orbit
- A full outer orbit means stability

Groups

- 3 main groups are the metals, non-metals and metalloids



Families

- Elements in the same family tend to have similar physical and chemical properties
- There are 4 main families – alkali metals, alkaline earth metals, halogens, and noble gases

Alkali Metals

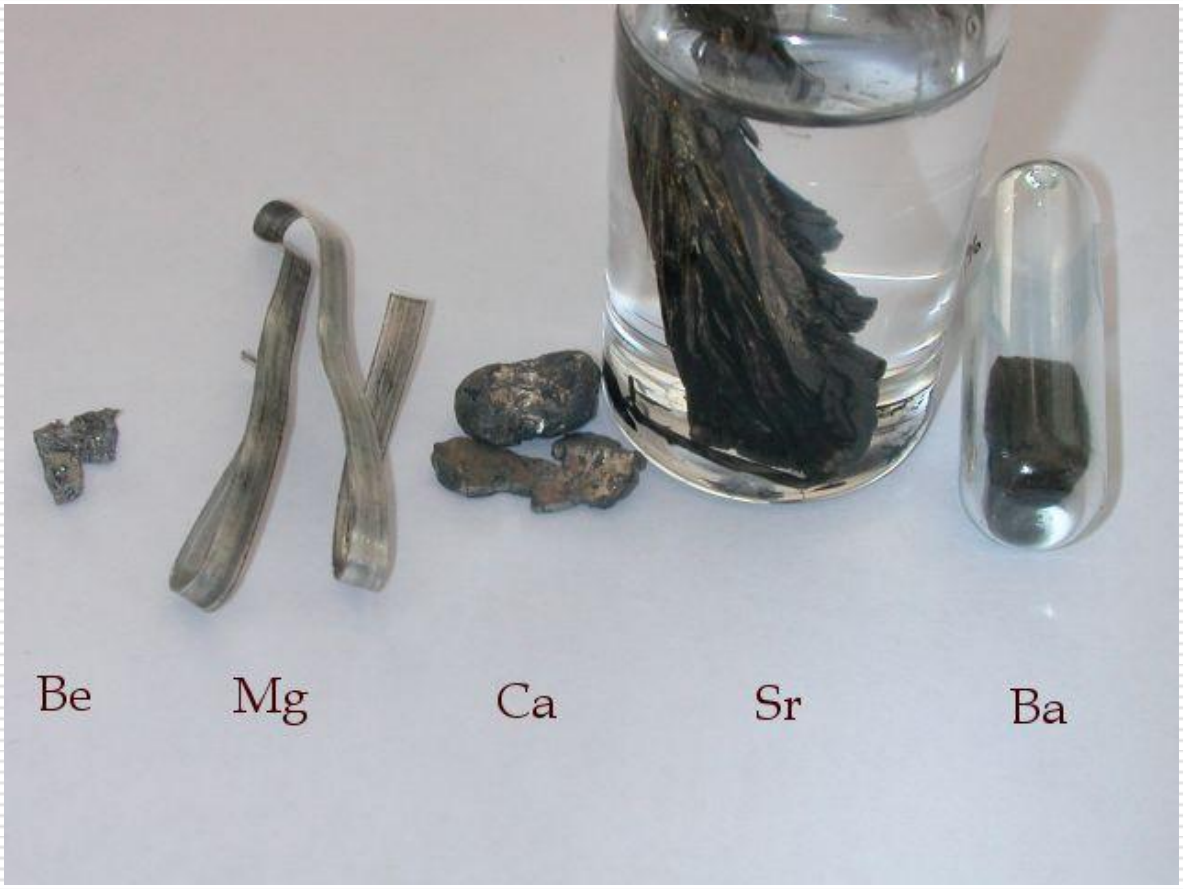
- Group 1 on periodic table (except H)
- Soft, shiny, very soluble in water
- Highly reactive (1 valence electron)
- Form compounds that are mostly white solids

Alkali Metals

Alkaline Earth Metals

- Group 2
- Shiny, silvery metals
- Mostly insoluble in water
- Reactive, but less so than alkali metals (2 valence electrons)

Alkaline Earth Metals

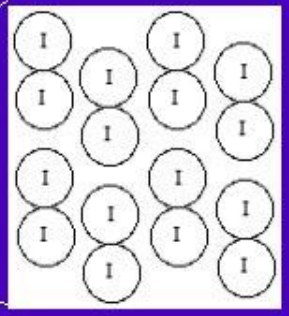


Halogens

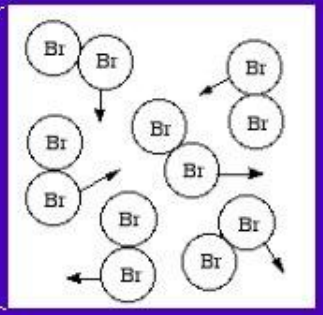
- Group 17
- Highly reactive, (7 valence electrons)
- Poisonous
- All three states of matter at room temperature

Halogens

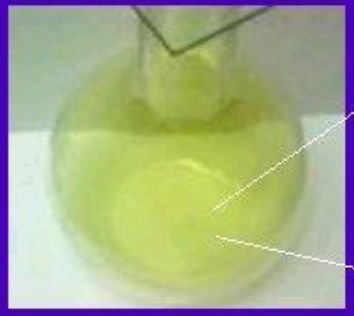
iodine I_2 — solid

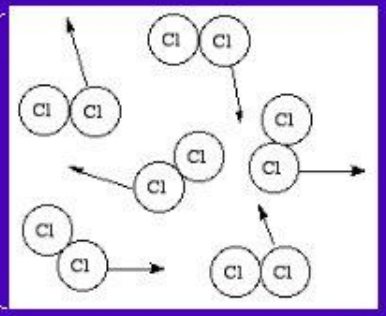


bromine Br_2 — liquid



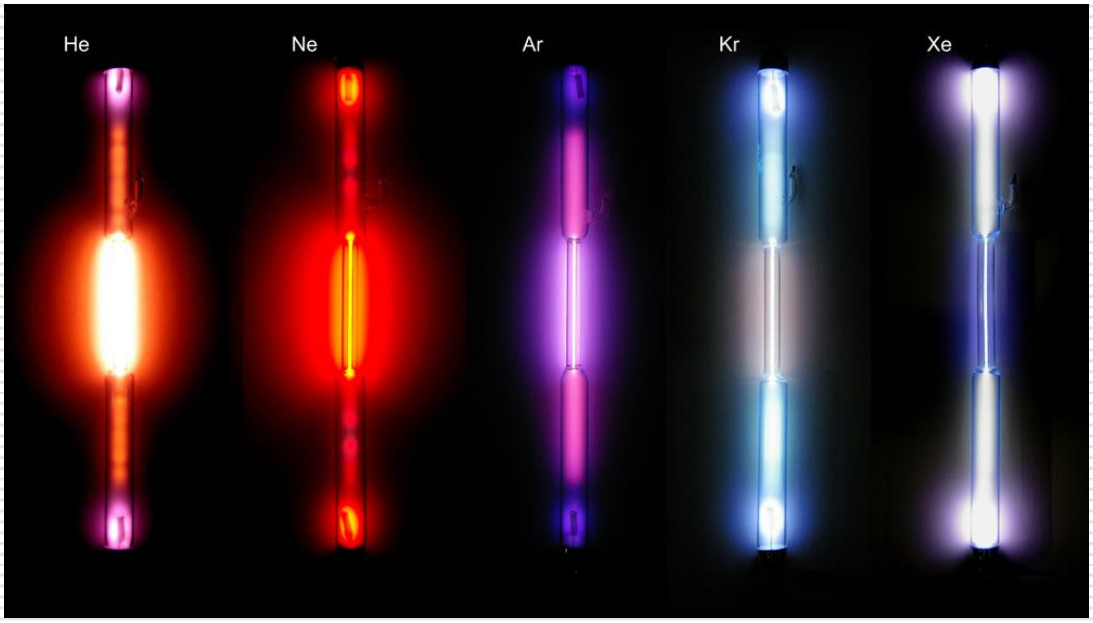
chlorine I_2 — gas





Noble Gases

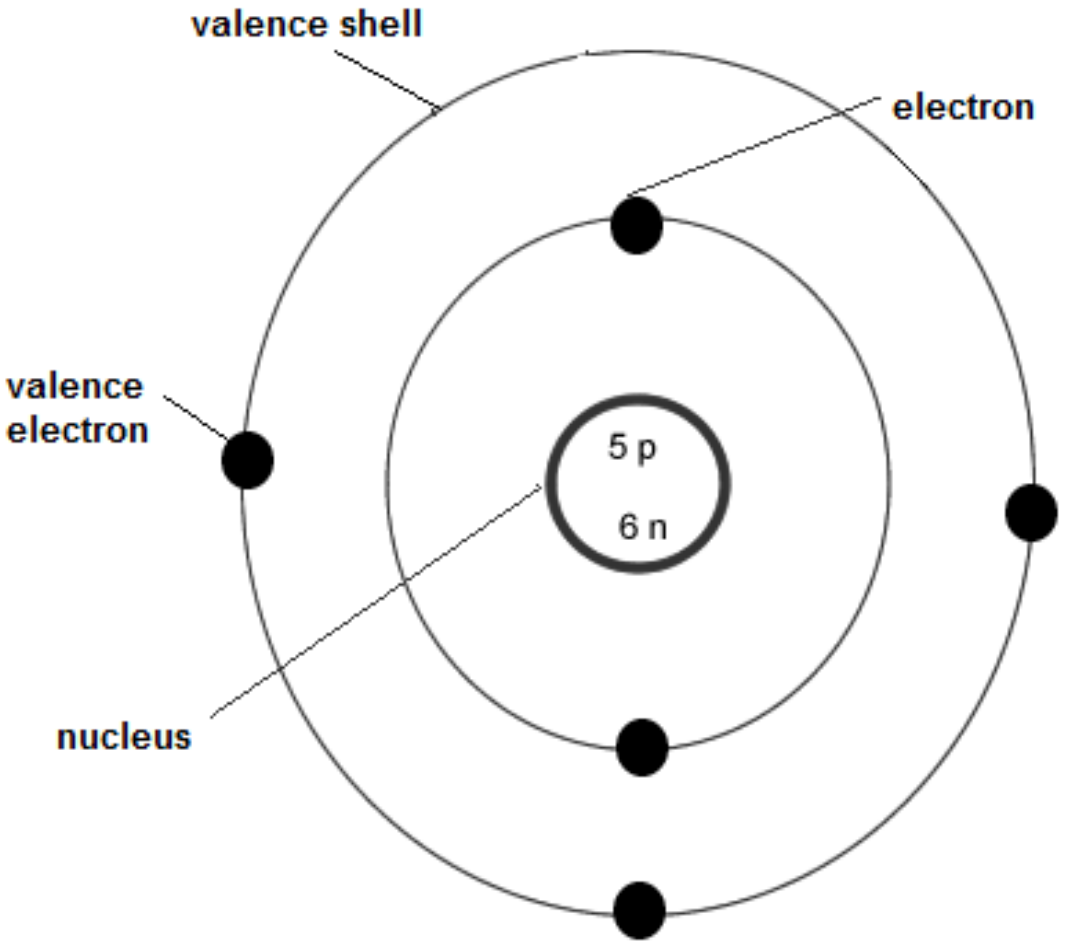
- Group 18
- Very stable (8 valence electrons)



Electrons and Reactivity

- Arrangement of electrons about the nucleus is key to chemical reactivity and formation of compounds
- Outer shell = valence shell
- Electrons in outer shell = valence electrons
- Electrons required gain or lose to achieve stability = valence #

Electrons & Reactivity



Predicting Reactivity

- Valence electrons have the most energy
- The further the electron is from the nucleus, the easier it is to remove from the atom and therefore the more reactive the atom is.
- Filled outer orbits are the most stable arrangement for any atom

Homework

- Periodic Table Crossword
- B-R. Diagrams 20 Elements
- Page 187 # 1 – 4, 6