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Science 9 – Chemistry Topic 2.3 – Concept 3: The periodic table shows how properties of elements change in predictable ways.

1. Atomic Size Increases Moving Down a Group

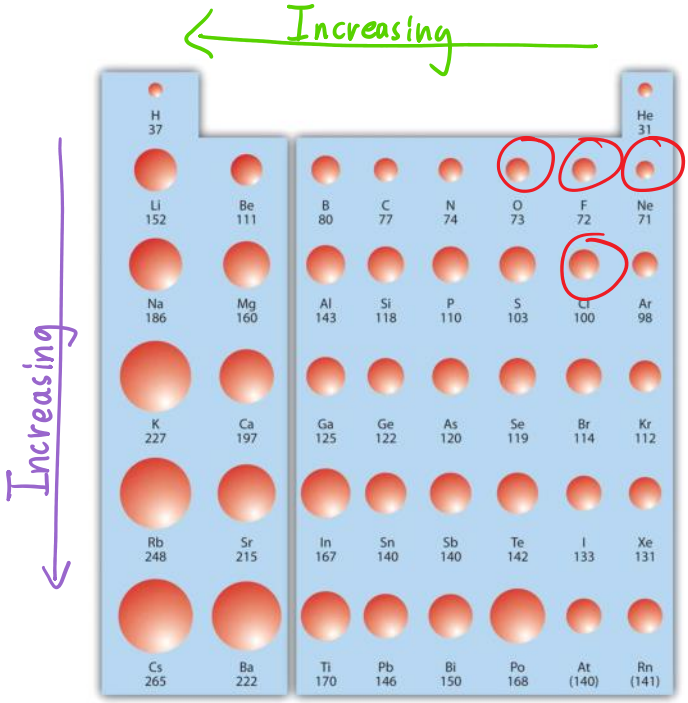
- As you move down a group, elements have atoms with increasing numbers of energy shells
- The greater the number of shells, the farther the valence electrons are from the nucleus, → Larger atom

2. Atomic Size Decreases Moving Left to Right Across a Period

- Elements have increasing numbers of electrons across a period
- Number of occupied valence shells stay the same, but the number of protons in the nucleus increases
- Attraction between valence electrons and the nucleus increases because a greater positive charge on the nucleus pulls more strongly on the electrons
- Therefore, the electrons are pulled more tightly towards the nucleus, leading to Smaller atomic size

1) Atom size increases as you go down a column (↓) because you are adding more Shells !

2) Atom size decreases from left to right. (—>) because adding more electron in the same shell makes + and – attraction Stronger, thus the atom get smaller

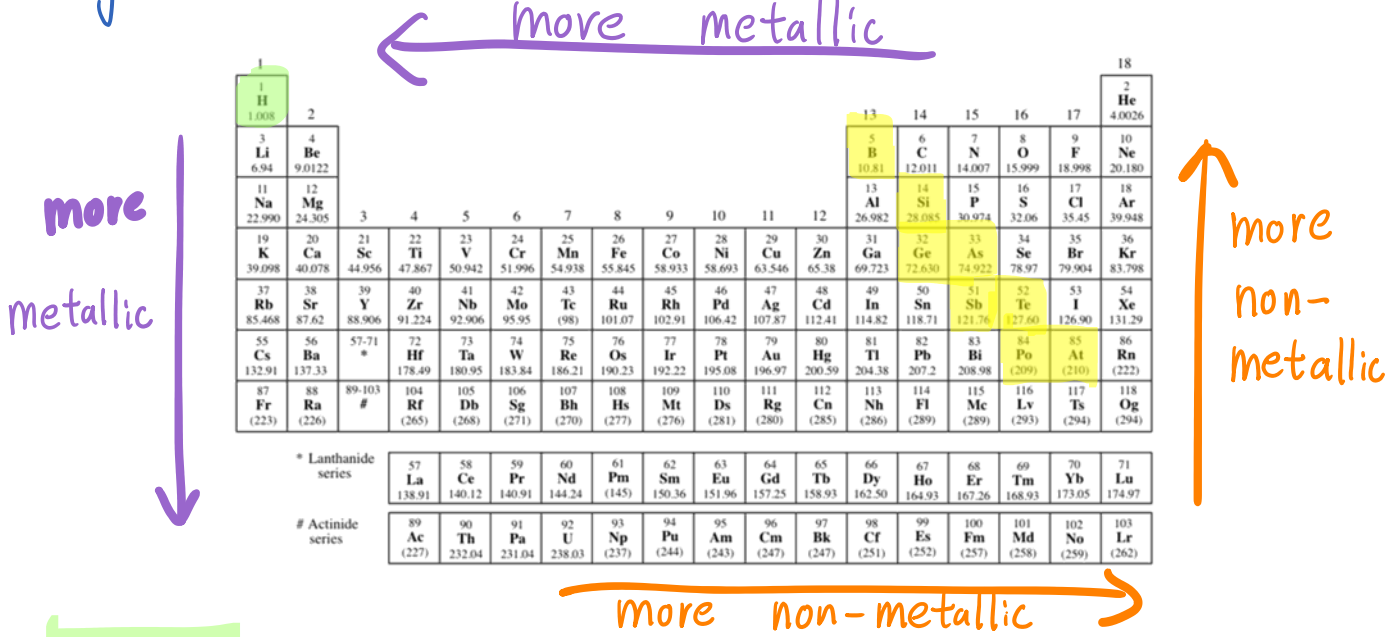


* Smallest He

* Largest Fr

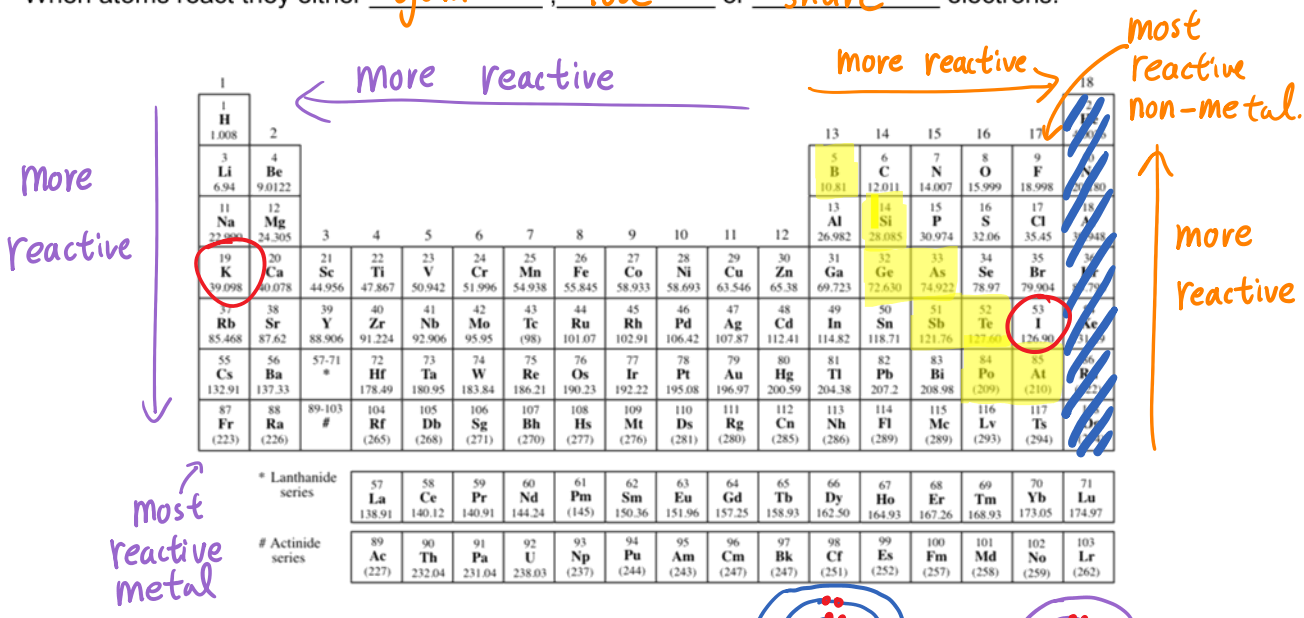
Metallic vs. Non-Metallic:

Generally when metals form ions they ___lose___ electrons and when non-metals form ions they ___gain___ electrons.

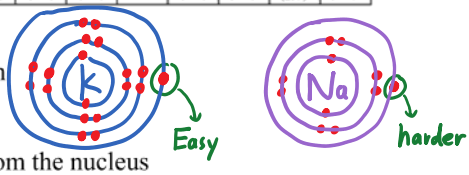


Reactivity:

When atoms react they either ___gain___, ___lose___ or ___share___ electrons.



Ex, Group 1 metals: Potassium is ___more___ ___reactive___ than sodium



- Both have ___one___ valence electron
- Potassium atom is ___large___ than sodium
- Potassium atom's valence electron is ___farther___ ___away___ from the nucleus
  - Pull of the positive charge on the nucleus is ___weaker___
  - Valence electron is ___easier___ to remove (less energy is needed to remove the electron)