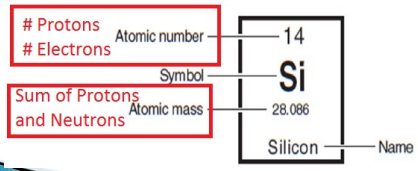
Isotopes & Ions

Mr. Sudbury

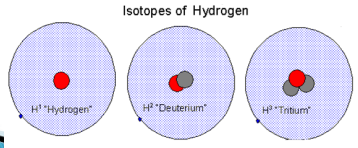
Atoms Review

- Atoms are the building blocks of matter.
- All matter is made from atoms.
- We can determine subatomic particles from the Periodic Table of Elements.

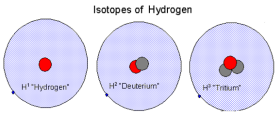


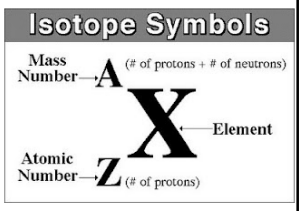
Isotopes

- ***Isotopes*** are atoms of the same element that have a different mass.
- Isotopes of an element have the ***same atomic number*** (same # protons), but have a ***different atomic mass*** (due to different number of neutrons.)



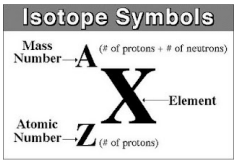
Isotope Symbols

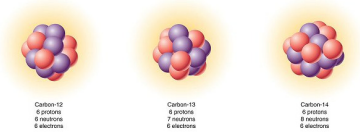




Writing Isotope Symbols

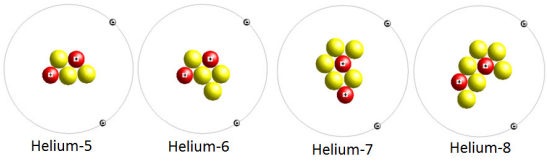
- We can use a shorthand abbreviation to symbolize isotopes.
- Nuclear Symbol…….. →





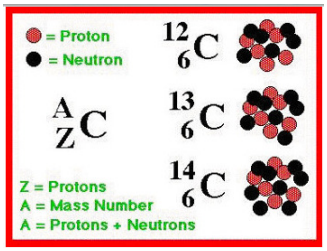
Writing Isotope Symbols

- You can also write the **name-mass**.
- Called hyphen notation.

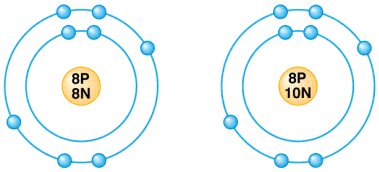


Isotopes of Carbon

- Most elements can have multiple isotopes.
- The general term for any isotope of an element is a ***nuclide***.



Isotopes of Oxygen



Ions

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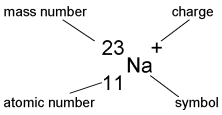
Ions

- An ***ion*** is an atom or group of bonded atoms that has a positive or negative charge.
- Why?
- Atoms want to be stable. To be stable they want a full outer shell of their electrons.
- Gain *electrons* to fill makes a – ion
- Give away *electrons* to fill makes a + ion.

Writing Ions

- To symbolize an ion you write the chemical symbol for the atom and place the charge as a superscript to the right of the symbol.



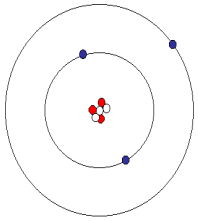
Fe^{2+}

Ions

- It is IMPROTANT to remember that atoms NEVER EVER lose or gain protons.

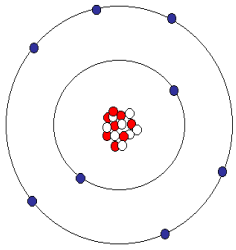
Ions

Lithium
- 3 protons
- 3 neutrons
- 3 electrons



Ions

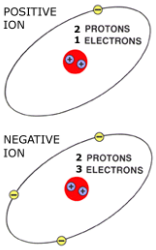
Oxygen
- 8 protons
- 8 neutrons
- 8 electrons



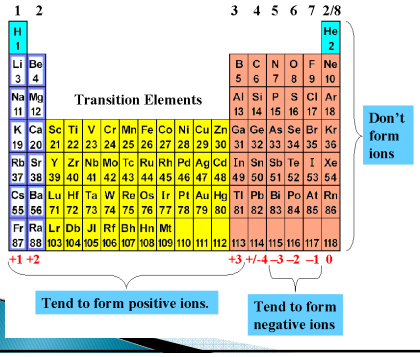
Oxygen Atom

+ and – ions

- If the protons outnumber the electrons because an electron was lost, the ion is positive.
- If the electrons outnumber the protons, because an atom gained extra electrons, then the ion is –



Trends in the PT



Review

- Isotopes
  - Different versions of the same element.
  - Different masses because of different amount of neutrons in the nucleus.
  - Sum of all isotopes by abundance is the average atomic mass on the periodic table.
- Ions
  - Atoms that have lost or gained electrons to become stable.
  - Positive charge is you lose electrons.
  - Negative Charge is you gain electrons.

The End