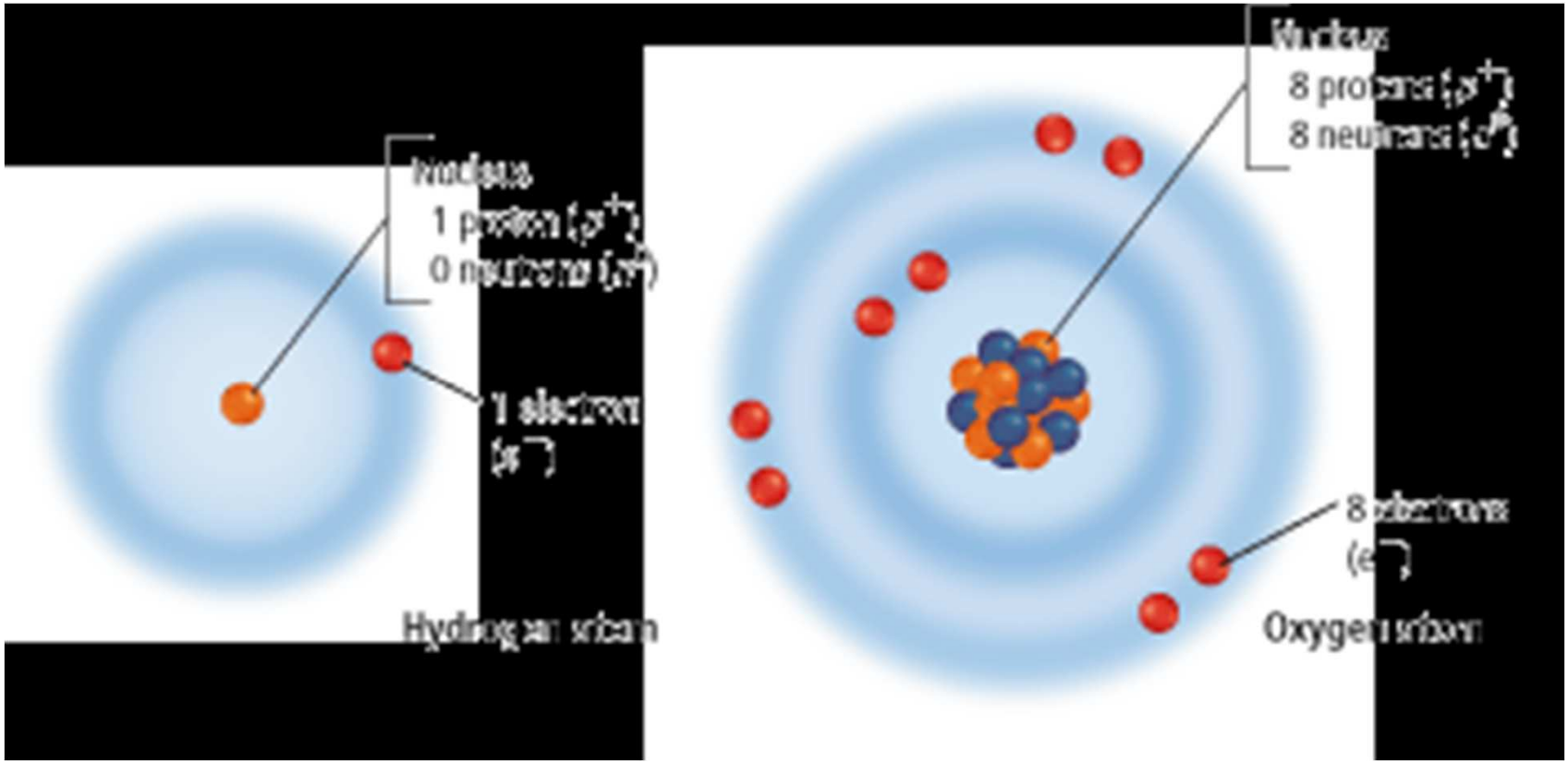
Atoms, Elements and Compounds

Section 6.1

Atoms

- Chemistry studies matter – its composition and properties
- Matter – has mass and takes up space
- All organisms in biology are MADE of matter
- Atoms make up all matter
  - So small that billions fit on the head of a pin
  - Made of two parts:
    - Nucleus (center)
    - Electron cloud (outside the nucleus)

Atoms



Protons, Electrons and Neutrons

Protons
- Positive charge
- Located in center of the atom (nucleus)
- Symbol: p^+
- Attracted to electrons
- Make up part of the atom's mass
- Tell the identity of the atom
  - Number on the periodic table

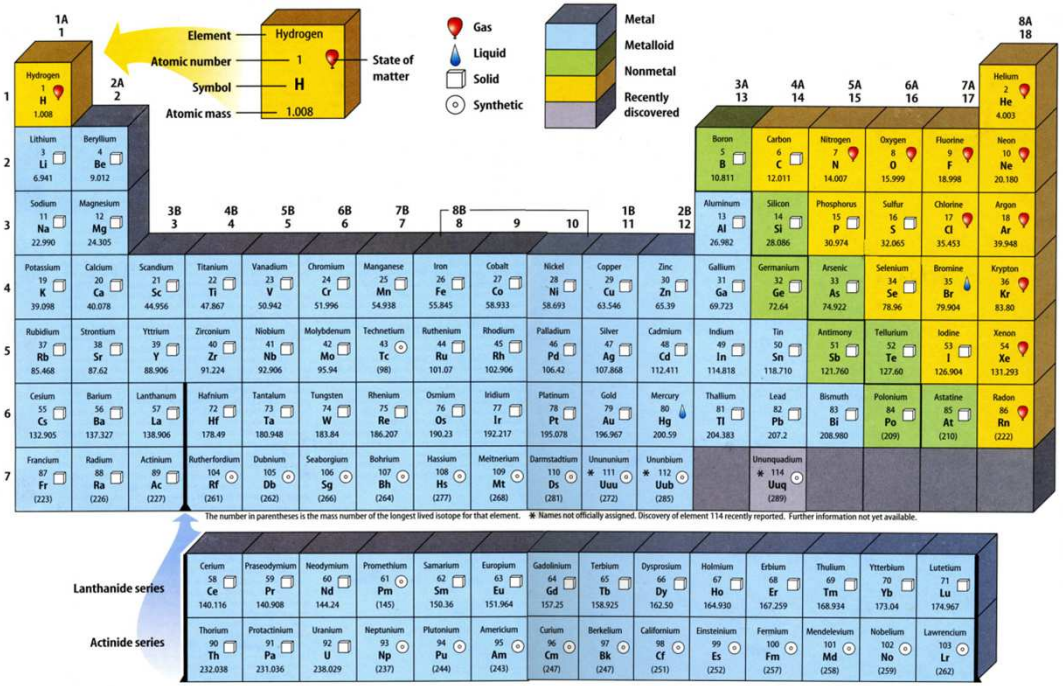
Electrons
- Negative charge
- Located around the nucleus in a "cloud"
- Symbol: e^-
- Attracted to protons
- Have very little mass
- Are involved with bonding and reactions

Neutrons
- No charge
- Located in center of the atom (nucleus)
- Symbol: n^o
- No attraction
- Make up part of the atom's mass

Elements

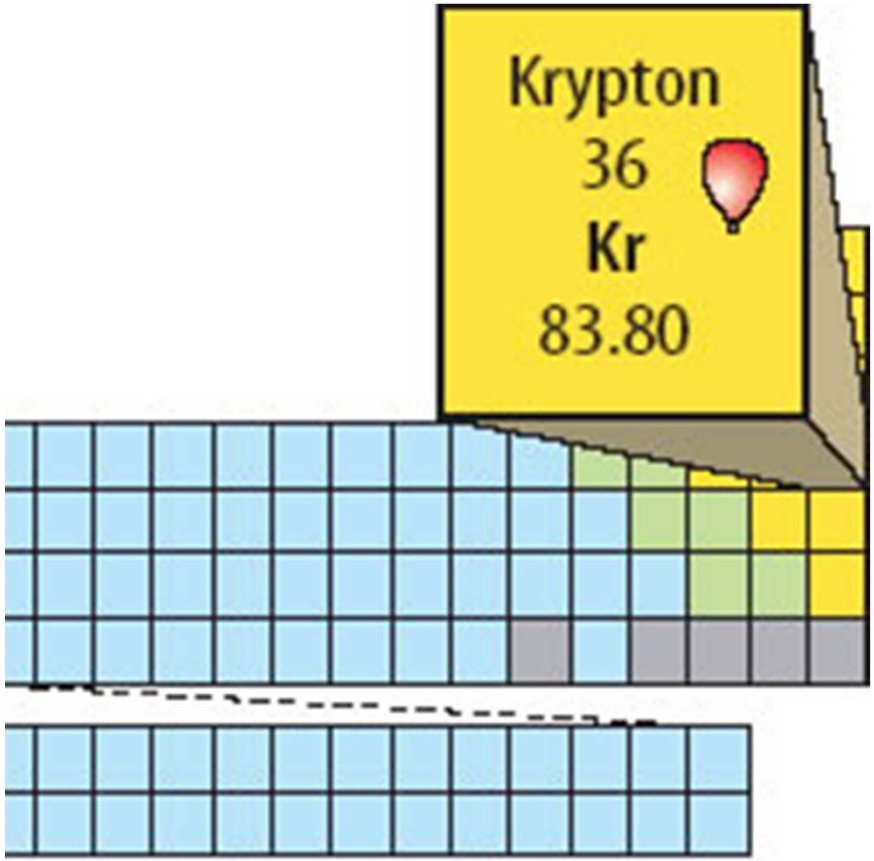
- Pure substance
- Cannot be broken down into simpler things
- Over 100 known elements
  - 92 occur naturally
  - All others are manmade in a lab
- Have unique names and symbols
- All information is collected on the periodic table of elements

Periodic Table of Elements



- Organized in rows and columns
  - Rows – periods (7)
  - Columns – groups (18)
- Every block is an element
- Blocks in the same group have similar properties
- Each block gives specific information about the element

Periodic Table of Elements



- Name
  - Always spelled out
  - Named after Greek, Latin, towns, people, etc
- Atomic Number
  - Whole number
  - Equals the number of p+
- Symbol
  - Always starts with a capital letter
- Atomic Mass
  - The mass of the element
  - Equals the $p^+ + n^0$