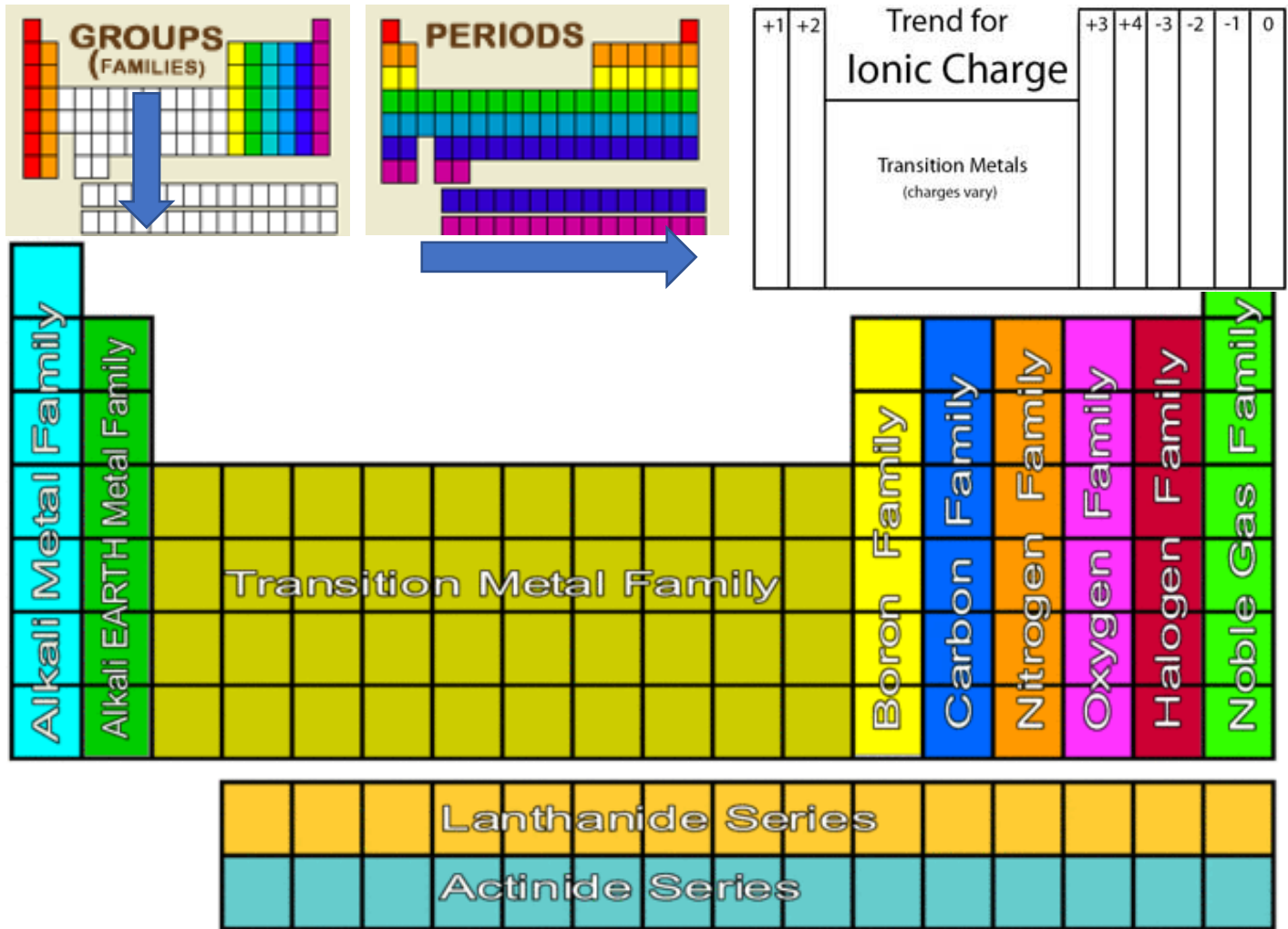


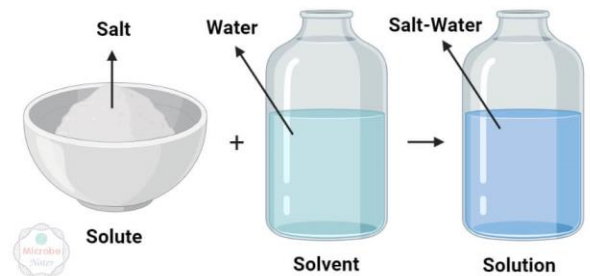
## Chemistry 1.11 Notes: More Periodic Table & Solutions



### Solutions

**Solution:** a mixture of one or more solutes dissolved in a solvent (it's homogeneous)

- ✓ **Solute:** the substance that is dissolved
- ✓ **Solvent:** the substance that does the dissolving
- ✓ **Miscible:** “mixable” like salt and water
- ✓ **Immiscible:** “not mixable”, like oil and water
- ✓ **Saturated:** the solution contains the maximum amount of solute that is capable of being dissolved
- ✓ **Unsaturated:** a solution that contains less than the maximum amount of solute that is capable of being dissolved
- ✓ **Supersaturated:** a solution that contains more than the maximum amount of solute that is capable of being dissolved



**Dissolution:** the process of being dissolved

**Hydration:** the process of being dissolved in water

**Solvation:** the process of being dissolved in any solvent other than water

**What affects rate of dissolution? (What makes something dissolve faster?)**

- Stirring: more contact between molecules
- Crushing: more surface area of solute
- Increasing the temperature: energizes the solvent molecules and increases speed/rate of contact with the solvent

**What does “like dissolves like” mean?**

If the molecules are same structure, they dissolve better.

- polar substances dissolve only in polar
- non-polar dissolve only in non-polar
- non-polar and polar substances do not mix  
(like oil which is nonpolar—and water which is polar)

**Solubility:** the amount of solute that will dissolve per volume of solvent

*\*what matters most is the amount of solute in the solution\**

✓ **Molarity:** # of moles of solute per liter of solution (based on mass)

✓ **Molality:** # of moles of solute per kilogram of solution (based on volume)

**What affects solubility?**

- Polarity (like dissolves like)
- Pressure
- Temperature


## Chemical Energy

**Chemistry is largely a study of energy**—the energy stored in bonds transferred between atoms and molecules to find stable bonds, and the energy released into the environment to do work.

**Chemical energy:** a kind of potential energy which exists because of the position of bonds. It is created when bonds between atoms break apart.

**Energy:** the capacity to do work or produce heat

**Heat:** not actually contained in an object, it is an energy transfer



**What is Chemical Energy?**

- o Energy that is available for release from chemical reactions.

**The chemical bonds in a matchstick store energy that is transformed into thermal energy when the match is struck.**



**DELTA ( $\Delta$ ):** how we write “change” in Chemistry  
(used to write change in heat of a solution like this:  $\Delta H$  solution)

### Endothermic Reaction:

- ✓ Absorbs heat
- ✓ Cools the surroundings
- ✓ It takes in energy
- ✓ Heat flows into the system

Endothermic processes:

- Photosynthesis
- Melting ice cubes
- Melting solid salts
- Sublimation of dry ice into carbon dioxide gas

### Exothermic Reaction:

- ✓ Releases heat
- ✓ Temperature of surroundings rise
- ✓ It gives off energy
- ✓ Heat flows out of a system

Exothermic processes:

- Combustion (like an engine)
- Condensation of water vapor into rain
- Acid dissolving into water
- Ice cubes freezing
- Steam from a teapot condensing into droplets
- A lake freezing over

