Factors that Affect the Solution Process

Recall that for a solute to dissolve, it has to be attracted to the solvent. The “like dissolves like” rule, which is referring to polarity, is only part of the picture. There are other factors that influence solubility.

1. Intermolecular forces: This is the “like dissolves like” rule. Simply put, the polarity of the solute and the solvent have to be matched. This is because the intermolecular forces that are involved have to be the same for the solvent particles to have a strong enough attraction to the solute particles. Even within this there are exceptions: Some ionic compounds are simply attracted to each other so strongly that the attraction to water is simply not strong enough to get them to dissolve.
2. Small molecules tend to be more soluble than large molecules.
3. For gases, pressure has a big influence on solubility. The higher the pressure the more of a gas you can dissolve in a solvent.
4. Most solutes are more soluble at higher temperatures.

**Rate of Dissolving**

Often in industrial processes, or even in the kitchen, the rate at which something dissolves is important. There are three factors that affect how fast a solute dissolves:

1. Temperature: Most solid solutes dissolve faster at higher temperatures. This is because the solvent has a higher kinetic energy, and are therefore moving faster and collide with the solute more often.
2. Agitation: Stirring or shaking the solute bring fresh solute into contact with the solvent, and causes the solute to dissolve faster.
3. Particle size: If you crush a larger particle, the smaller particles have a greater total surface area than the original. More solute can be in contact with the solvent, so the rate of dissolving increases.