Colligative Properties of Solutions
During non-polar dissolving the particles of the solute and solvent fall into gaps of one another.
• Sugar doesn’t have a positive and negative end. There is no separation of the particles.
• Sugar in water dissolves but ions are not created, therefore can’t create electricity
During polar dissolving the opposite charges of the solute and solvent attract each other. The attraction will pull apart the solute molecules and dissolve the particles.
Dissolving & Conductivity

- During polar dissolving the opposite charges of the solute and solvent attract each other
- The attraction will pull apart the solute molecules and dissolve the particles
The presence of ions can determine the conductivity of a solution

The ions complete the circuit by allowing the flow of electricity
Colligative Properties

- Solutes can affect the physical properties of the solvents they are in

- **Colligative Properties**: Physical properties affected by the number, not the type of the dissolved particles
  - Vapor Pressure Lowering
  - Boiling Point Elevation
  - Freezing Point Depression
Vapor Pressure (VP)

- Vapor Pressure – pressure of vapor over a liquid (by natural evaporation)
- Volatile vs Nonvolatile: (based on IMFs in solvent)
  - Volatile solvent: evaporates easily at normal T and P
    - Acetone or alcohols
  - Nonvolatile solvent: evaporates slower than volatile
- Solvent particles are “busy” surrounding solute particles (solvating)
  - Solvent particles are not as “free” to evaporate

- Pure solvents (no solute):
  - will have higher VP at liquid surface

- Impure solvents (has solute):
  - will have a lower vapor pressure at liquid surface
Some solutes can affect the physical properties by raising the boiling point of the solvent

- Example: Antifreeze in radiator water

- BP temp of pure solvent ↑ as solute particles ↑

- More solute added, lower VP → higher BP
• Solutes can lower the freezing point of the solvent
  • Example: Placing salt on icy roads
• FP temp of pure solvent ↓ as solute particles ↑
• More solute added, lower VP → lower FP