

Chapter 4: Aqueous Reactions & Molarity

What Happens to Solid Chemicals when they Dissolve?

- Solids exist in a **crystal lattice** - repeating pattern of _____ ions or molecules _____

Salt (NaCl) =

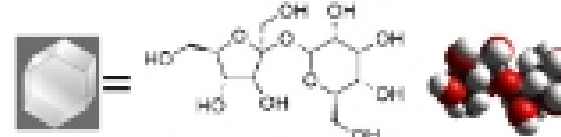
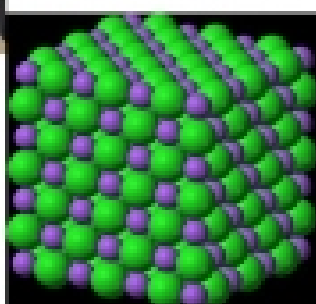
Sugar (C₁₂H₂₂O₁₁): Sucrose =



_____ Ions _____

_____ Molecules _____

Na⁺ = ●
Cl⁻ = ●

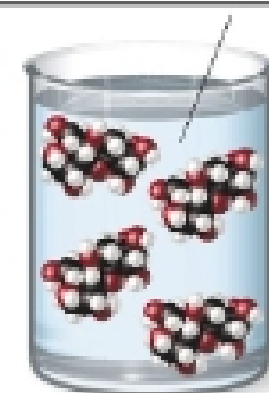


- Hydration** – water molecules _____ break apart _____ the crystal lattice of solids
 - 2 Types of break ups:

1. Break apart into individual _____ molecules _____

➤ Occurs when the chemical is _____ molecular _____

Dissolved _____ molecules _____
(Ex: sucrose)



2. Break apart into _____ ions _____, a process called **Dissociation**

➤ Occurs when the chemical is _____ ionic, acidic, or basic _____

➤ Resulting in an _____ electrolyte _____ solution

Dissolved _____ ions _____
(Ex: Na⁺ & Cl⁻)



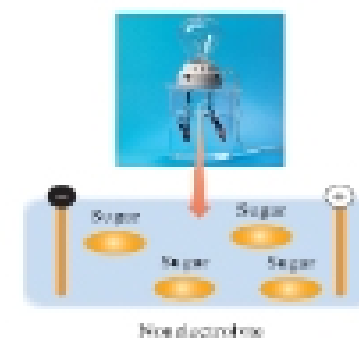
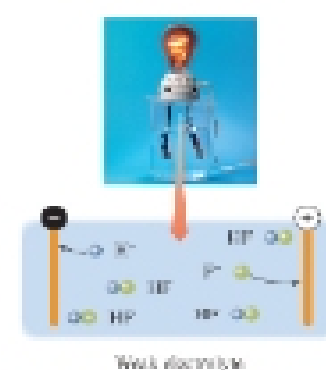
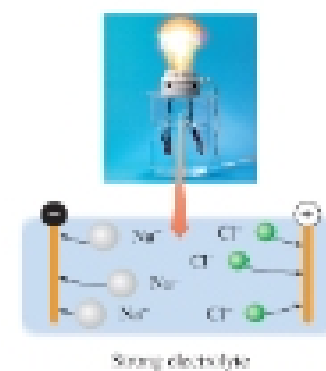
Electrolytes

- **Electrolytes** – a chemical *dissolved in water* that conducts _____ electricity _____ due to the presence of ___ IONS _____
 - **High conductance** values means _____ more ions _____
 - Which substance will conduct more? ___ The one with more ions _____
 - **Dissociation equations**- determines _____ which ions _____ are present
 - **How to write:** separate into **ions**, place **charges** above symbols, then **balance**



Types of Electrolytes

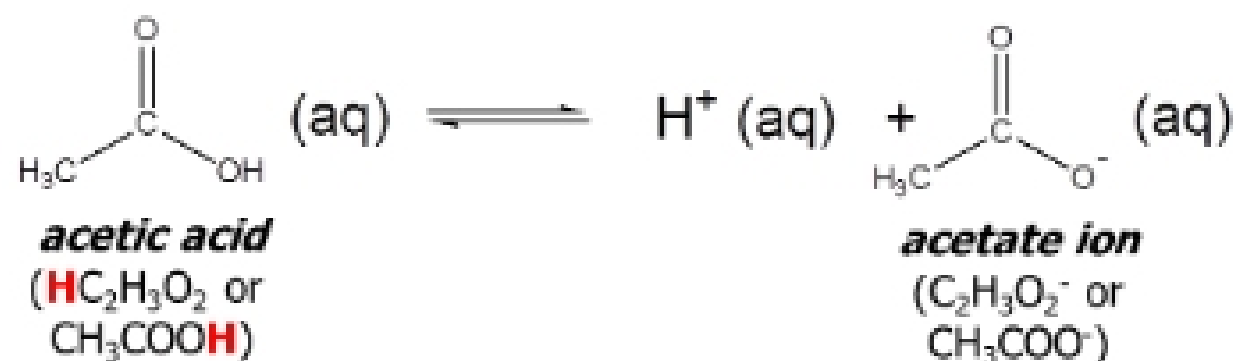
1. **Strong Electrolytes** – ___ **high** _____ conductance_
 - ___ **Many** _____ ions (___ **100%** _____ dissociation)
 - Made up of: ___ **Ionic** _____ compounds,
 - ___ **Strong** _____ acids & ___ **Strong** _____ bases
2. **Weak Electrolytes** – ___ **low** _____ conductance_
 - ___ **Few** _____ ions (___ **Partial** _____ dissociation)
 - More _____ molecules _____ than _____ ions _____ present
 - Made up of: ___ **Weak** _____ acids & ___ **Weak** _____ bases
3. **Non-electrolytes** – ___ **No** _____ conductance_
 - ___ **No** _____ ions (___ **No** _____ dissociation)
 - Made up of: ___ **Molecular** _____ compounds



Acid/Base Definitions

- **Acids** – Always produce a **proton** (H^+) **ion**

➤ Usually either **start** w/ H^+ or **end** w/ COOH



➤ **Protons** available (active) in an acid = # of FRONT H's

- $\text{HCl} = \underline{1} \text{ H}^+$
- $\text{H}_3\text{PO}_4 = \underline{3} \text{ H}^+$
- $\text{HC}_2\text{H}_3\text{O}_2 = \underline{1} \text{ H}^+$

4.1: Available protons?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

- **Bases** – Always produce a **hydroxide** (OH^-) **ion**

