Chemistry Day 63

Tuesday, March 12th – Wednesday, March 13th, 2019

Do-Now: "**BrainPOP: Water**"

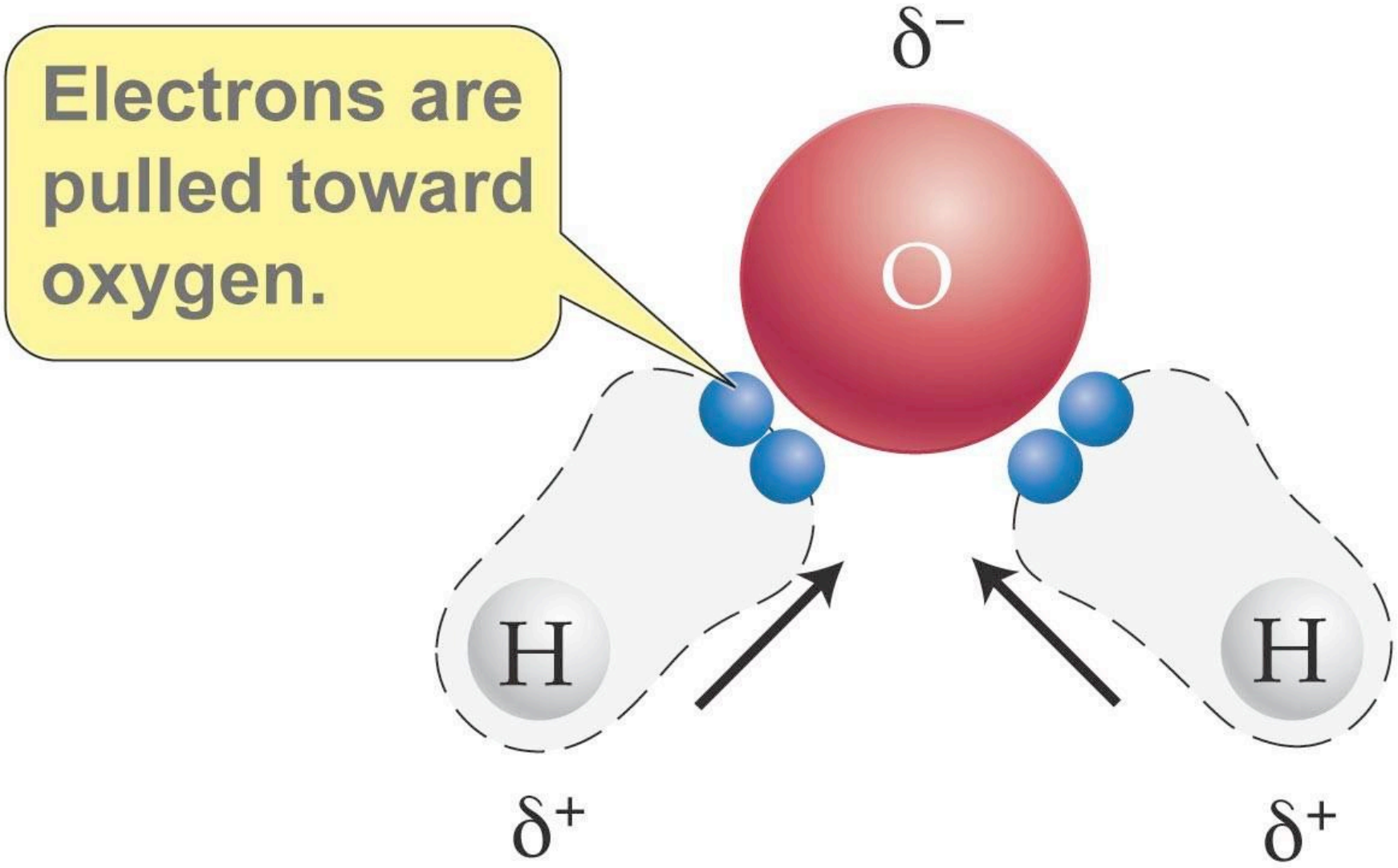
1. Write down today's FLT
2. *Copy & complete:* The forces that connect the O and the H in different H_2O molecules are called _____ bonds, but they are actually a type of _____ _____ instead of a chemical bond.
3. How do water molecules "stick" together?
4. Distinguish between adhesion and cohesion.
5. You want to add some sugar to your coffee/ tea. How do you make sure it dissolves?
6. Take out your planner and ToC.

Homogeneous Aqueous Solutions

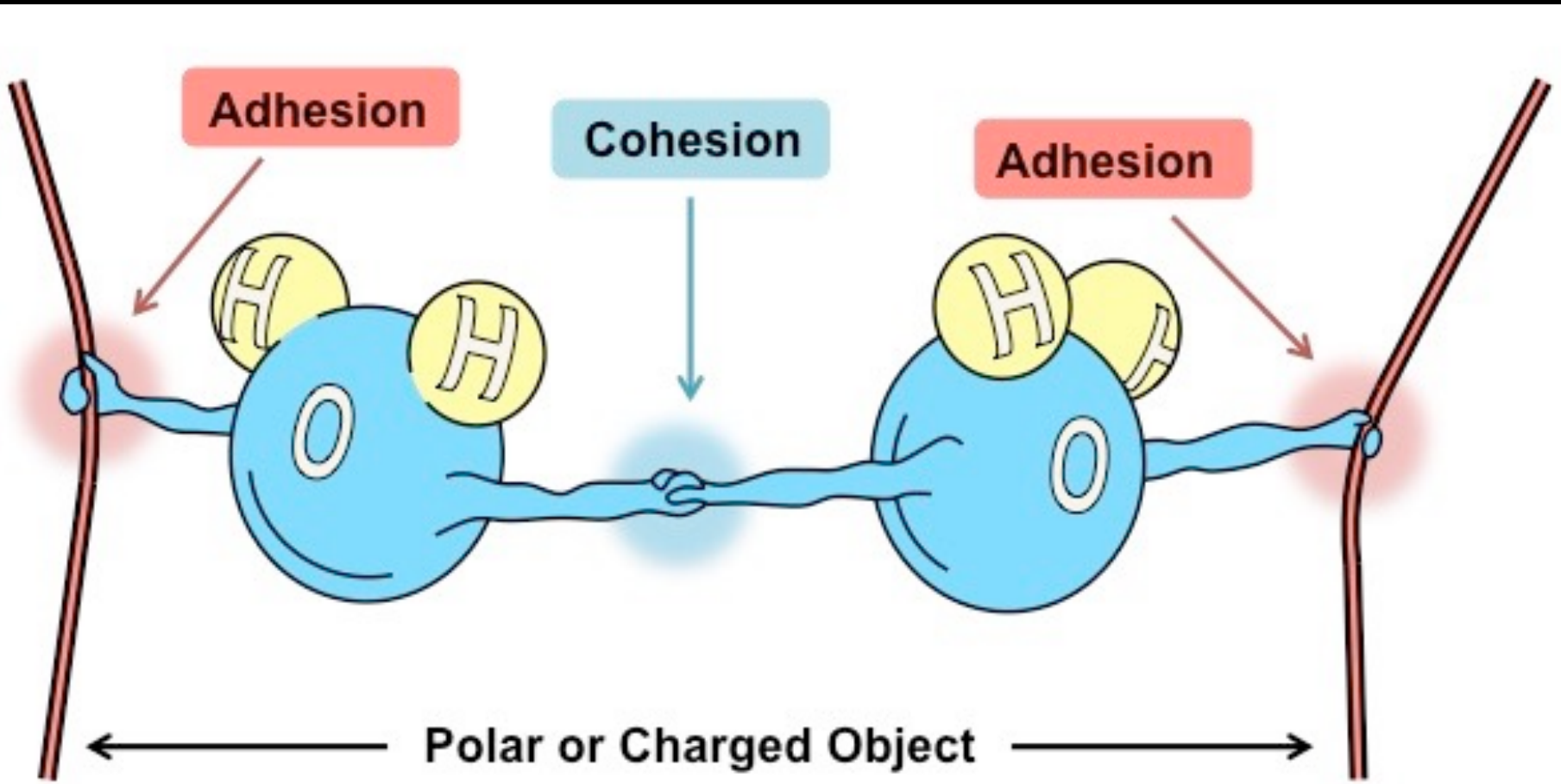
Video Notes (4)

Recall

Partial negative charge



Partial positive charge

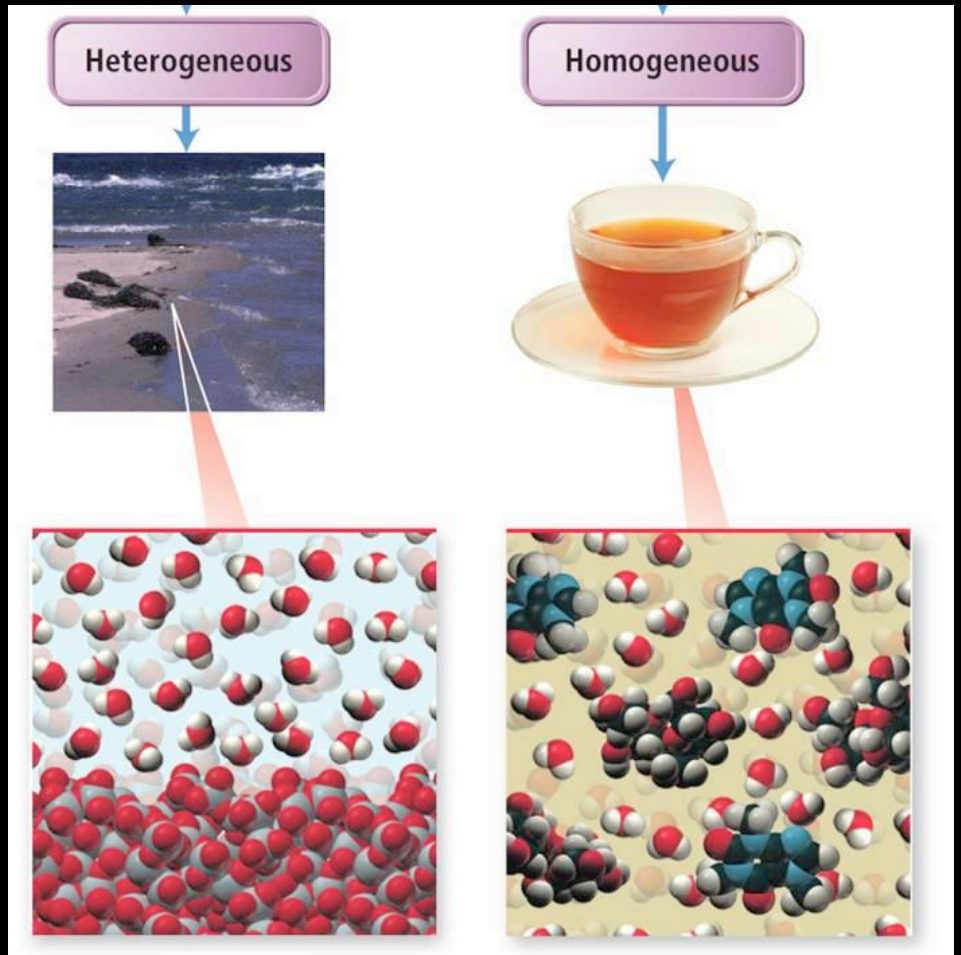

Adhesion
Cohesion
Adhesion
H
H
O
H
H
O
Polar or Charged Object

AliC Photography

Solutes and Solvents

Solvents and Solutes

- **Solution = homogeneous mixture of solvent + solute.**



Solvents and Solutes

- **Solvent = what you're dissolving *in***
- **Solute = substance you're dissolving**

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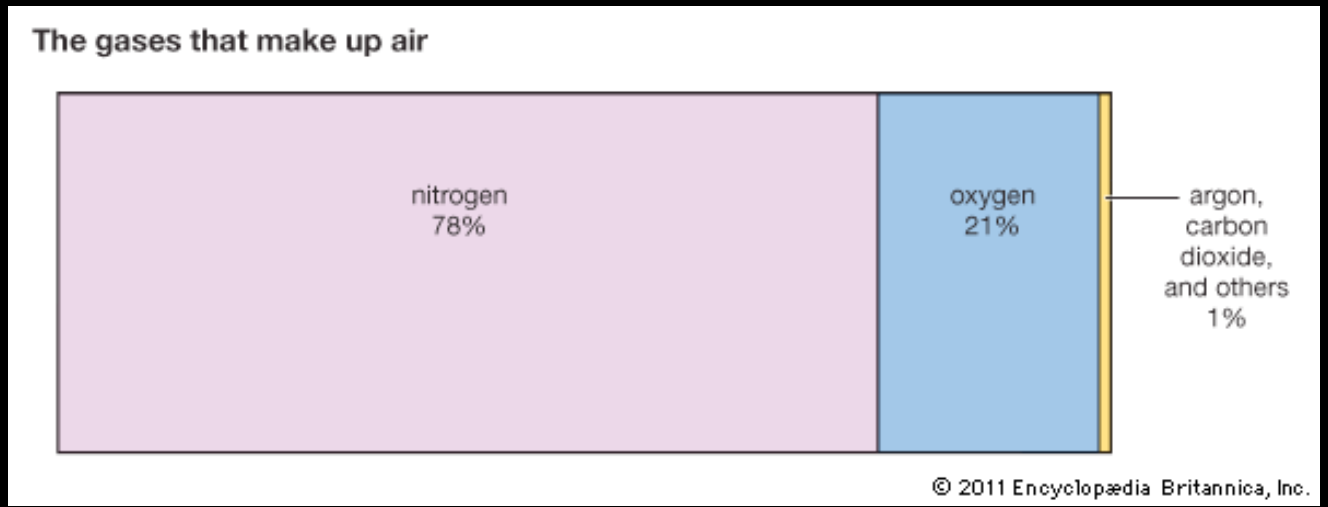
Aqueous Solutions

Solvents and Solutes

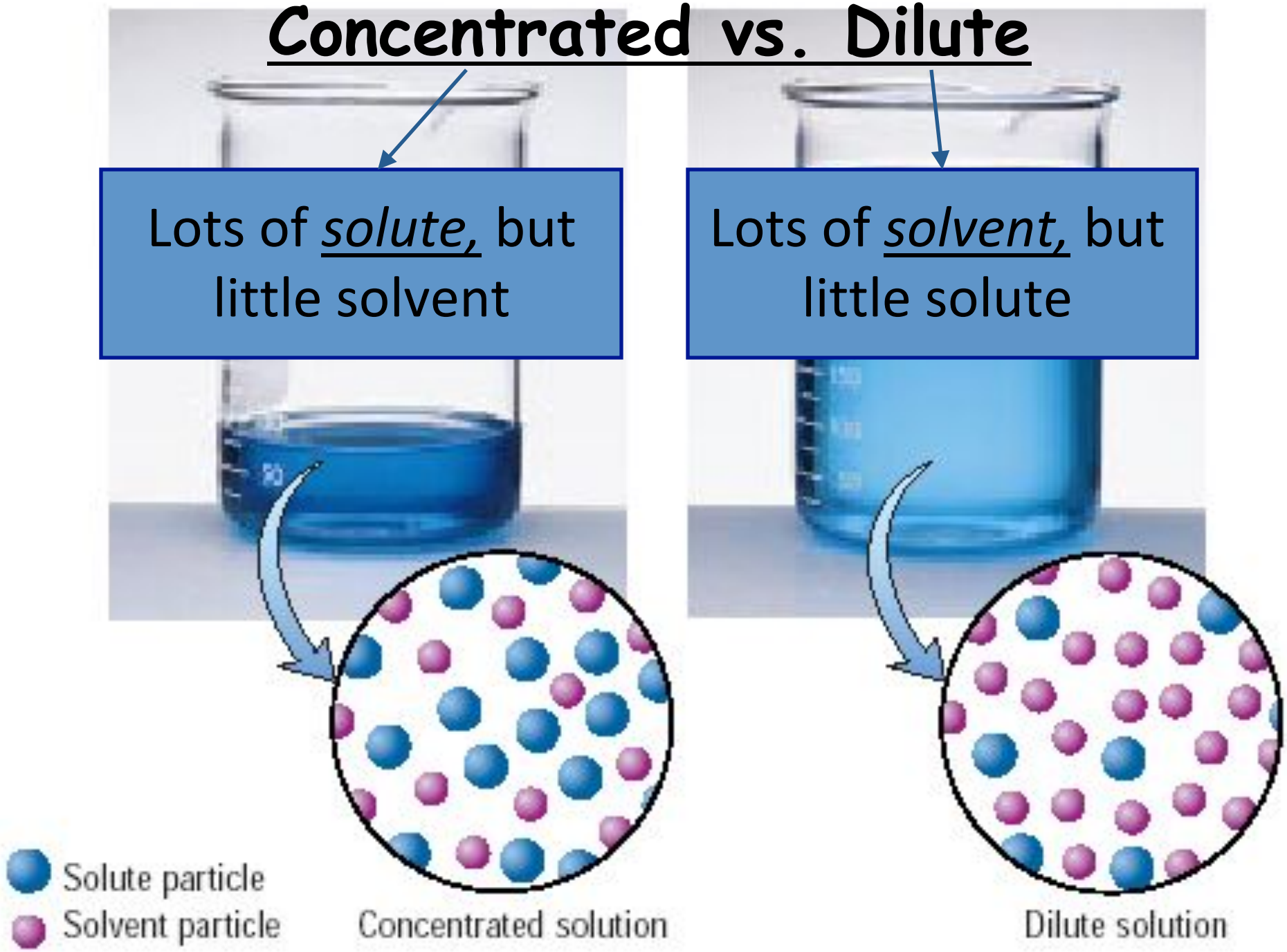
- **Aqueous Solutions = Homogeneous mixtures containing water**
- Keep in mind that solutions do not have to contain water, but this is the type we are studying in this chapter
- Ex/ Air is also a solution



Concentrated vs. Dilute

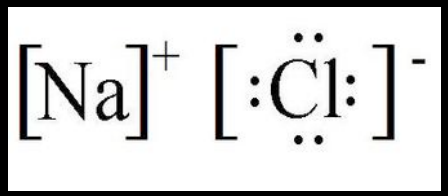
Lots of *solute,* but little solvent

Lots of *solvent,* but little solute

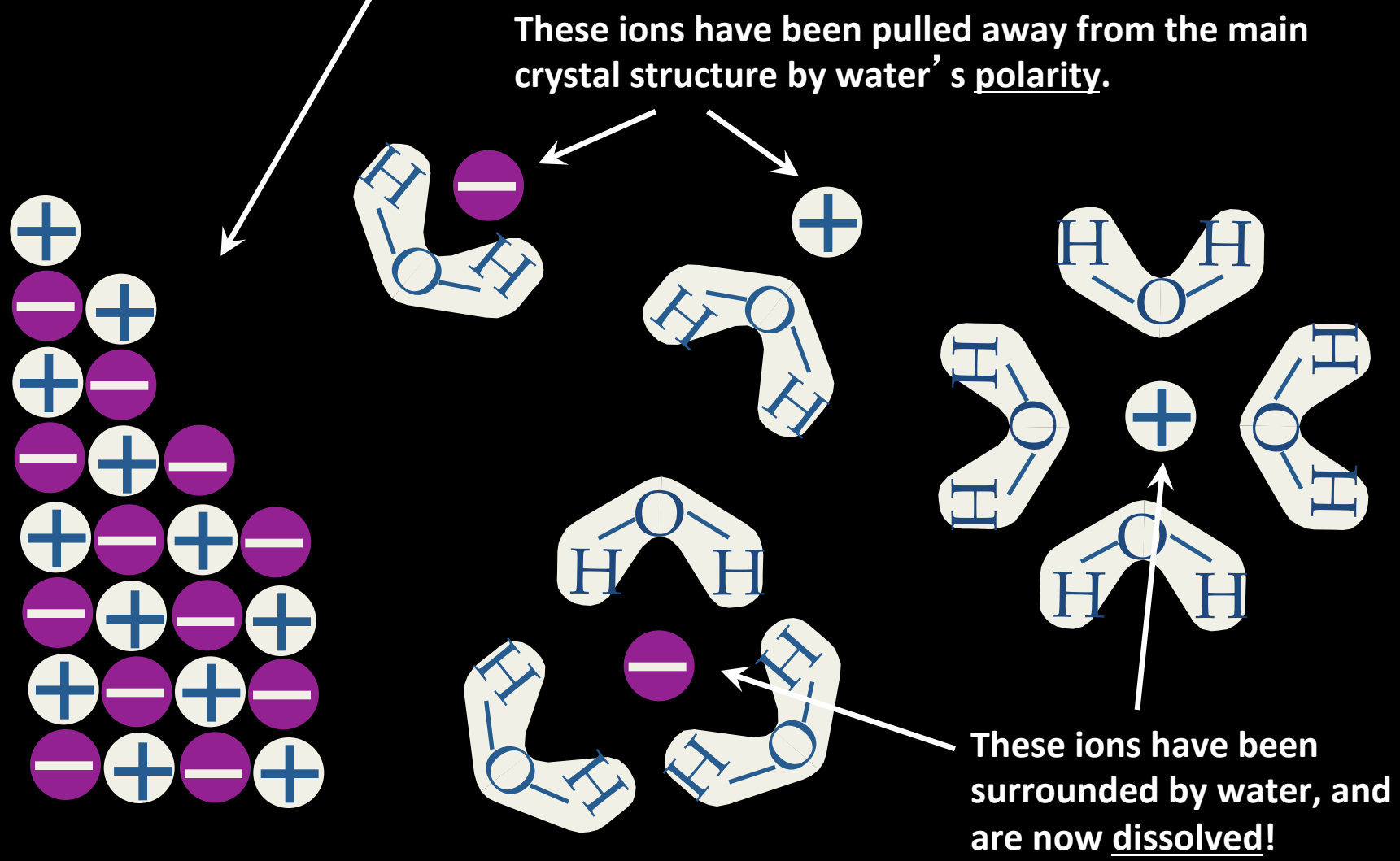


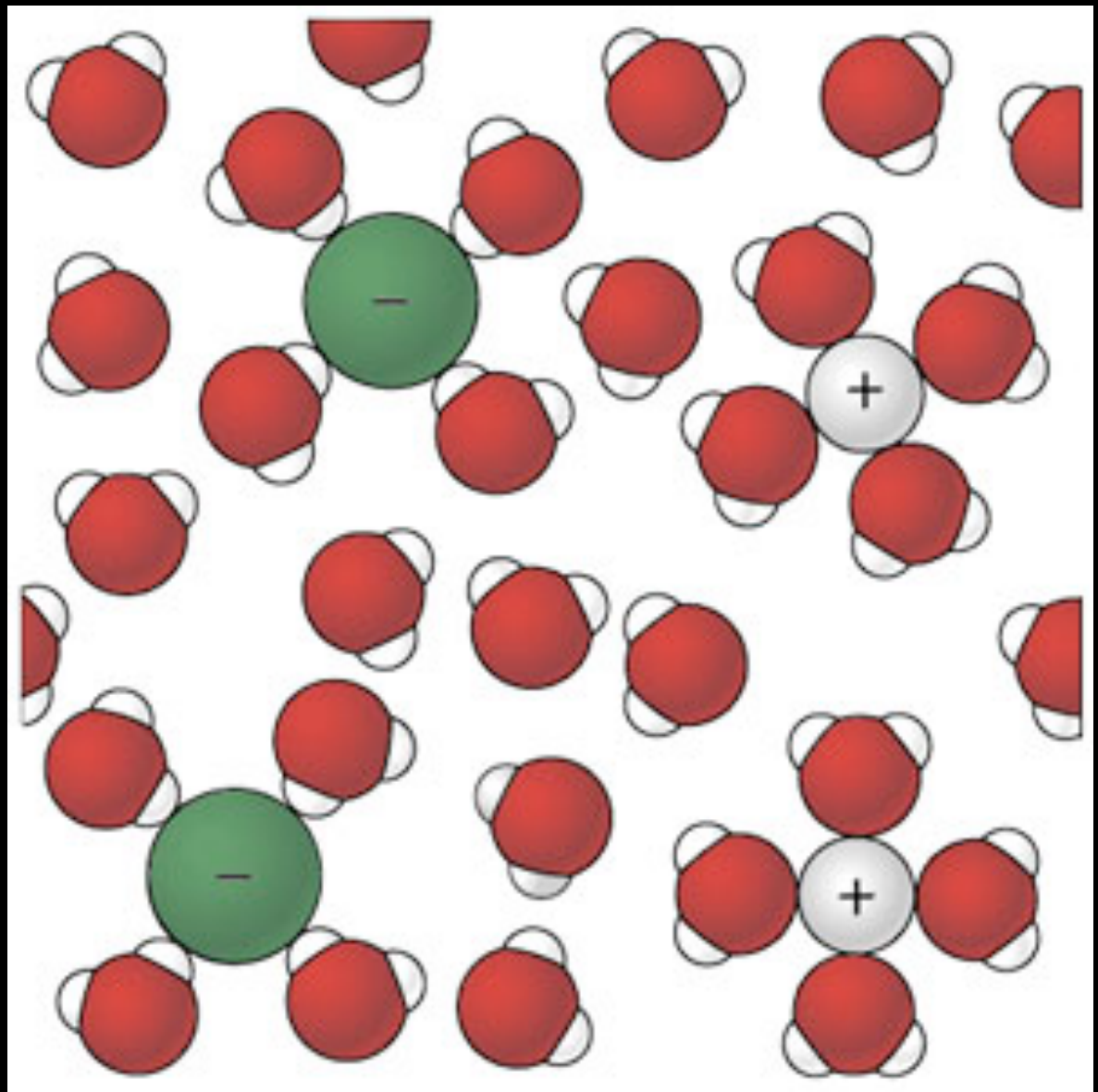
Aqueous Solutions

- What can water dissolve?
- **Like dissolves like = Water dissolves charged (ionic) and polar substances**
- Salt is ionic
- Oil is nonpolar



How Ionic solids dissolve in water



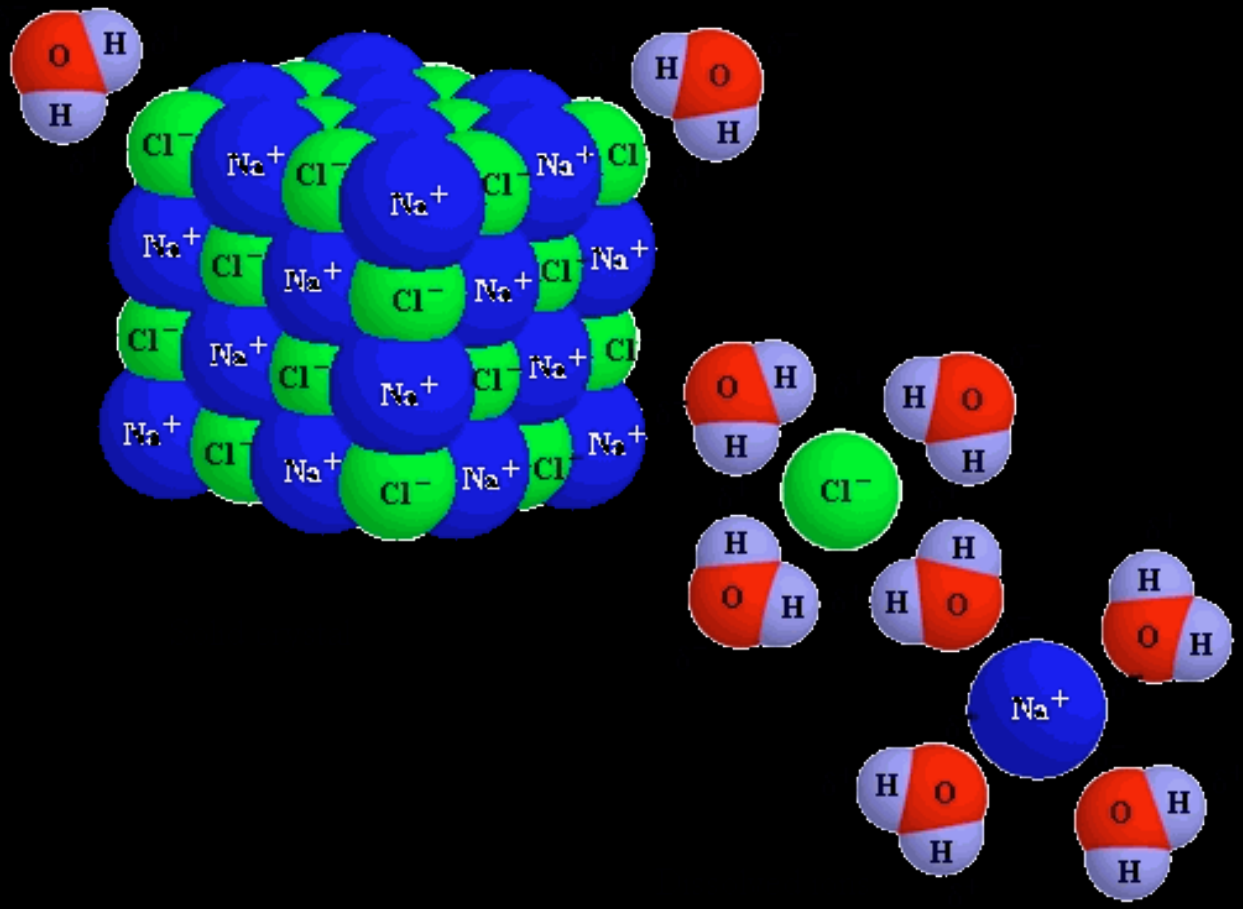


Let’s diagram **hydration** of NaCl:

Electrolytes and Nonelectrolytes

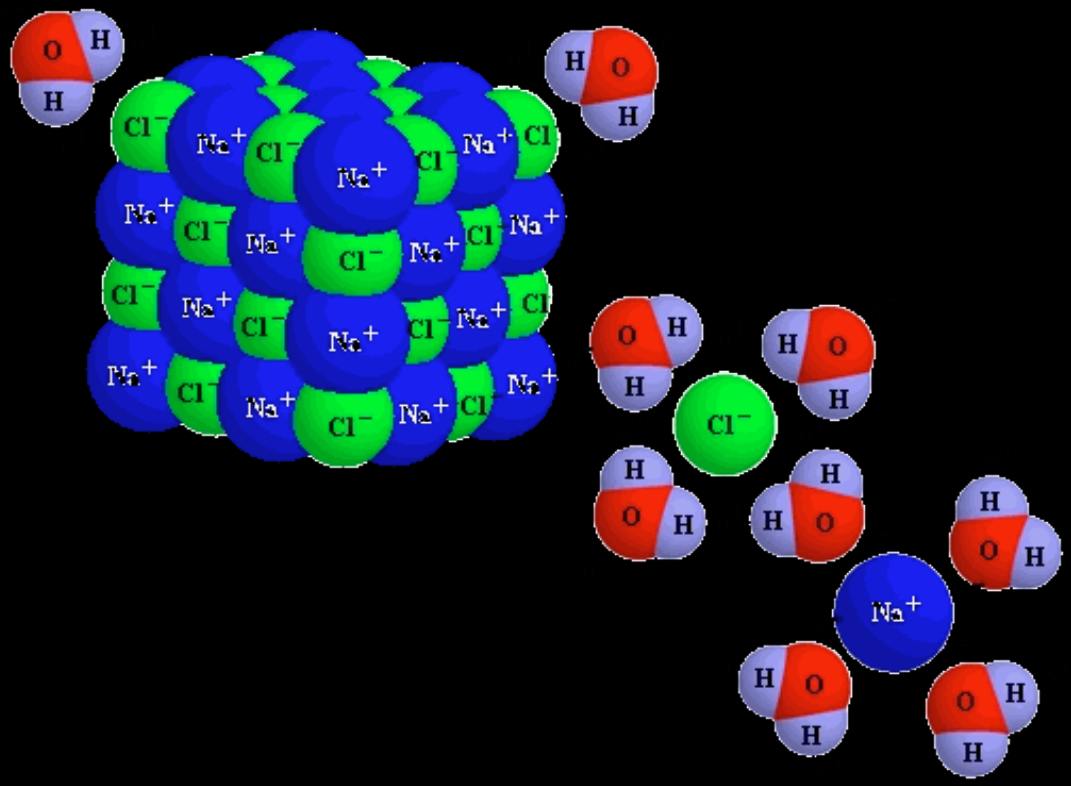
Electrolytes and Nonelectrolytes

- **Electrolytes = Dissolve into ions & conduct electricity in aq. soln.**


O
H
H
Cl⁻
Na⁺
Cl⁻
Na⁺
Cl⁻
Na⁺
Cl
Na⁺
Cl⁻
Na⁺
Cl⁻
Na⁺
Cl⁻

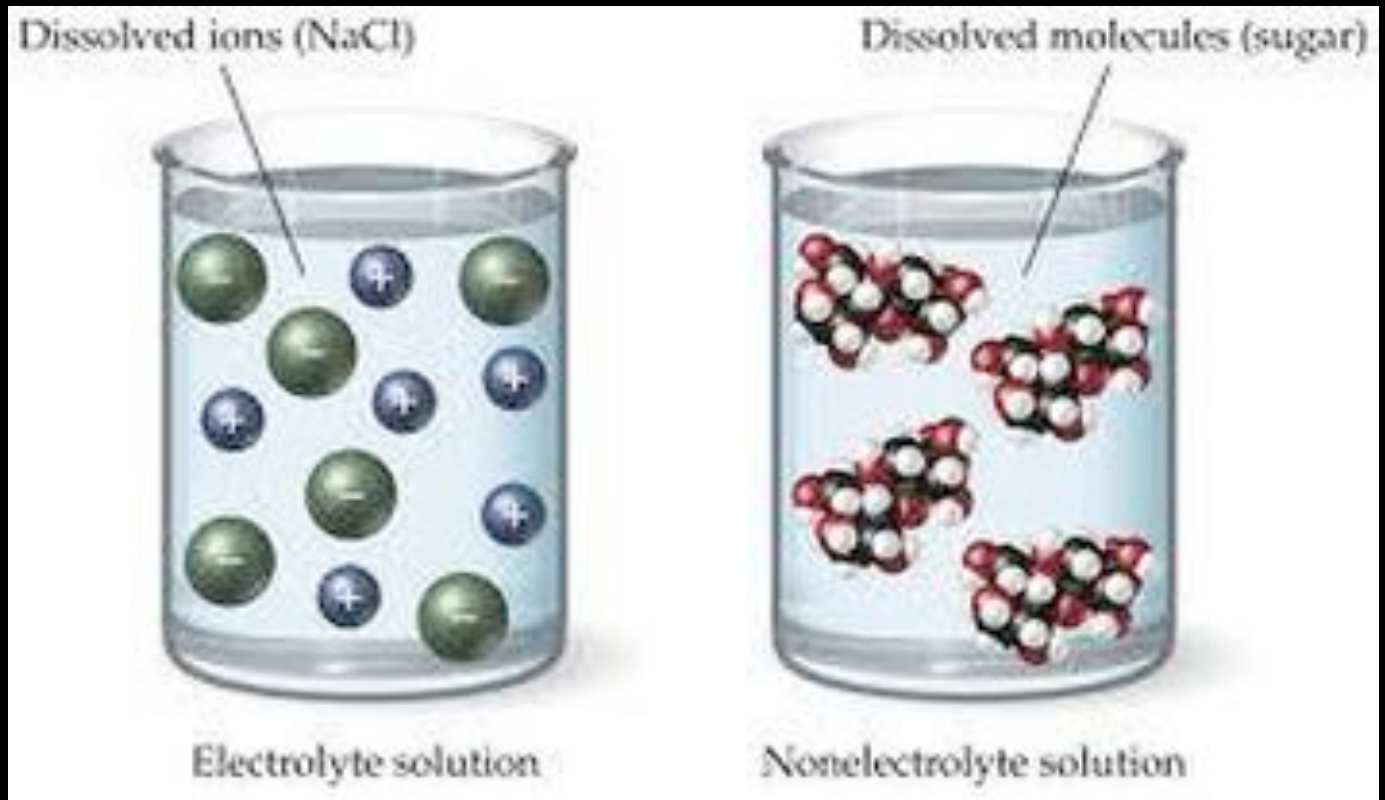
Electrolytes and Nonelectrolytes

- All ionic compounds are electrolytes because they dissociate into ions (they are also called “salts”)


O
H
H
H
O
H
Cl⁻
Na⁺
Cl⁻
Na⁺
Cl⁻
Na⁺

Electrolytes and Nonelectrolytes

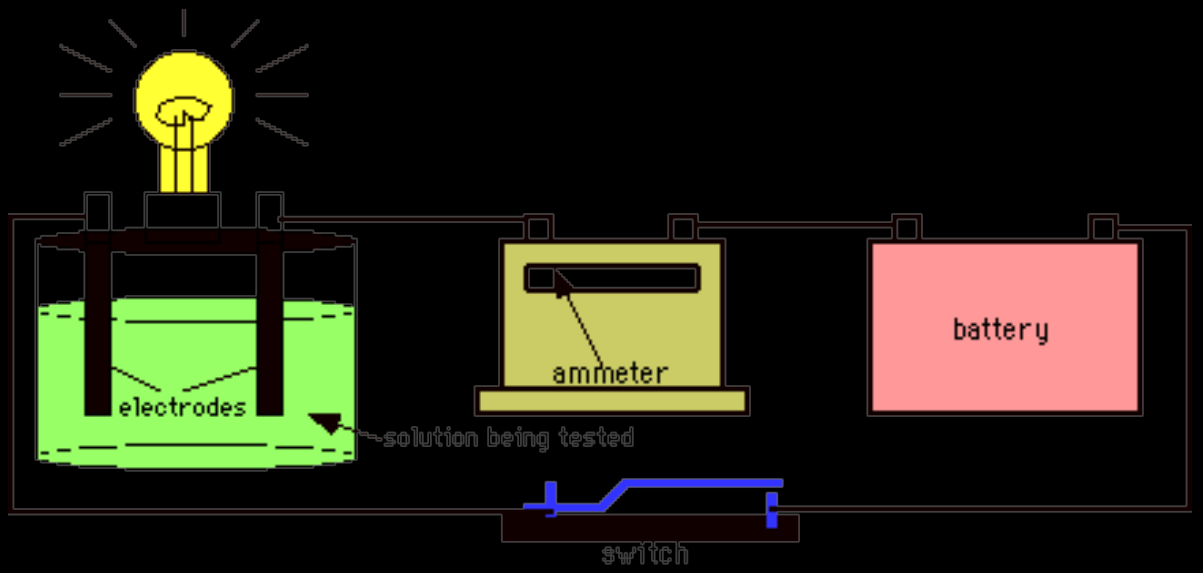
- **Nonelectrolytes = Do not conduct electricity in aq. soln.**
- Most are molecular/covalent (no ions)



Electrolytes and Nonelectrolytes

- Not all electrolytes conduct to the same degree
- There are weak electrolytes, and strong electrolytes
- Depends on: the degree of ionization
- Weak electrolytes only *partially* ionize.

Electrolytes vs. Nonelectrolytes



The ammeter measures the flow of electrons (current) through the circuit.

✓ **If the ammeter measures a current and the bulb glows, then the solution conducts.**

✓ **If the ammeter fails to measure a current and the bulb does not glow, the solution is non-conducting.**

Electrolytes and Nonelectrolytes

- **Strong electrolytes = ionize completely in soln' (ex/ salts, strong acids)**
- **Weak electrolytes = only partially ionize**
- Weak electrolytes have only a fraction of the solute that exists as ions

Strong Electrolytes are 100% ionized

salts $\xrightarrow{H_2O}$ 100%ions

$NaCl(s) \xrightarrow{H_2O} Na^+(aq) + Cl^-(aq)$

$CaBr_2(s) \xrightarrow{H_2O} Ca^{2+}(aq) + 2Br^-(aq)$

acids $\xrightarrow{H_2O}$

$HCl(g) \xrightarrow{H_2O} H_3O^+(aq) + Cl^-(aq)$

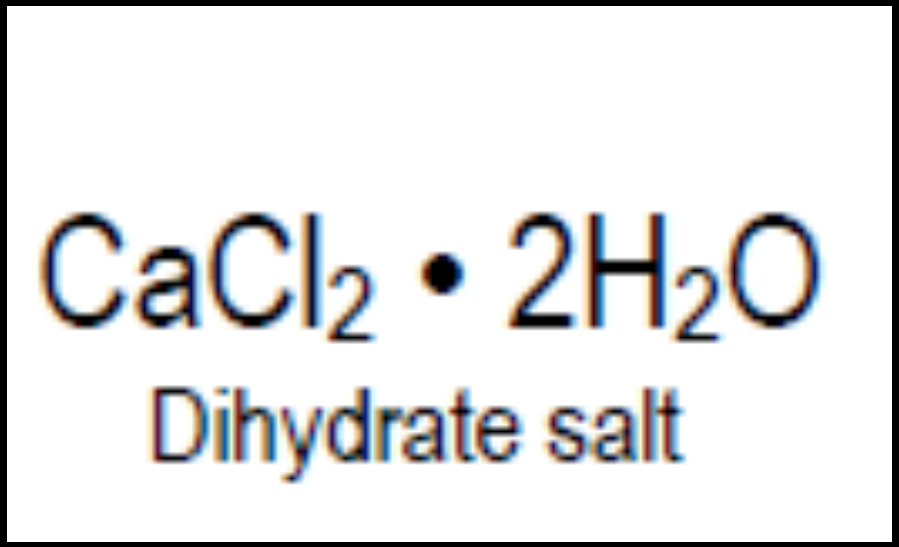
Bases $\xrightarrow{H_2O}$

$NaOH(s) \xrightarrow{H_2O} Na^+(aq) + OH^-(aq)$

Water of Hydration

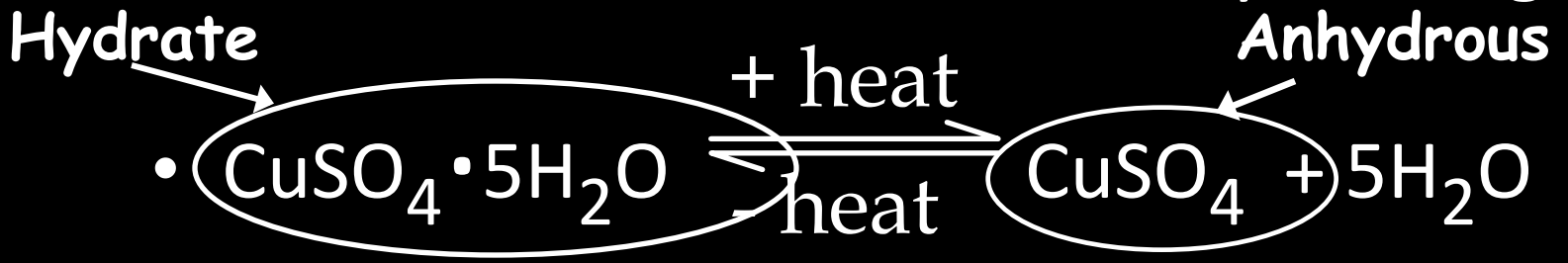
Hydrates

- Some compounds absorb water molecules and incorporate them into their chemical structures
- **Hydrate = substance that contains water**
  - Ex/



Water of Hydration
(or Water of Crystallization)

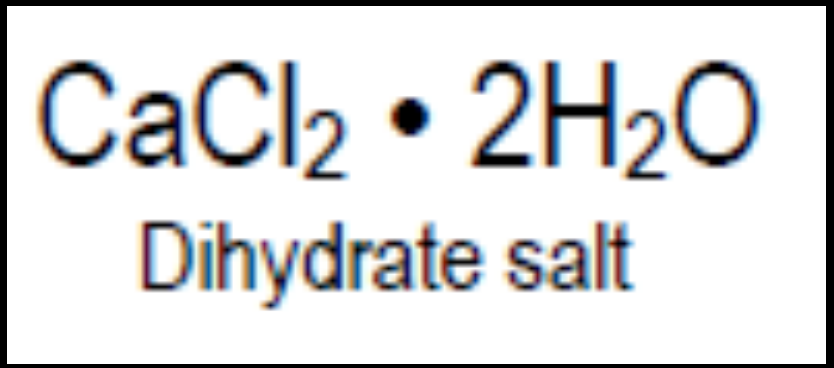
- Water molecules are chemically bonded to solid salt molecules (<u>not in solution</u>)
- These compounds have fixed amounts of water.
- The water can be driven off by heating:



- Called **copper(II)sulfate pentahydrate**.

Hydrates

- Could you find the molar mass of a hydrate?



Pair-Share-Respond

1. **What is a solution?**
2. **We did a lab where we created soda. In that lab, what was the solute, and what was the solvent?**
3. **You dissolve calcium fluoride in water. How will the water molecules hydrate the ions?**
4. **Distinguish between a weak and a strong electrolyte.**
5. **Define "hydrate".**

Chemistry Day 64

Thursday, March 14th – Friday, March 15th, 2019

Do-Now: "**Popcorn Lab Do-Now**"

1. Write down today's FLT
2. Identify the solute and solvent in a cup of coffee.
3. Molar mass allows me to convert from _____ to _____
4. How many grams of oxygen are present in 2.41 moles? Show all work.
5. We will be using bunsen burners today. Remind me: how do we use them safely?

Take out your planner, ToC, and a calculator