

Objectives: SWBAT. . .

- ... review solution basics.
- ... explain how intermolecular forces affect solubility.

**SOLUTION:**

**SOLVENT:**

**SOLUTE[S]:**

**AQUEOUS SOLUTIONS:**

*NOT ALL SOLUTIONS ARE AQUEOUS:*

| Mixture            | Solution State of Matter | Solvent State of Matter | Solute State of Matter |
|--------------------|--------------------------|-------------------------|------------------------|
| Air                |                          |                         |                        |
| Antifreeze mixture |                          |                         |                        |
| Brass              |                          |                         |                        |
| Carbonated water   |                          |                         |                        |
| Sugar water        |                          |                         |                        |

**THE BASICS OF SOLUBILITY:**

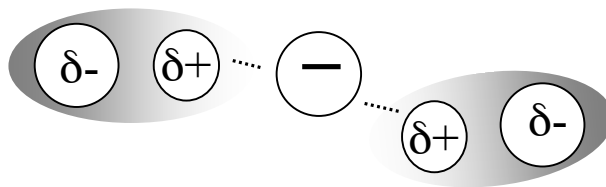
*UNDERSTANDING SOLUBILITY COMES DOWN TO ONE, SIMPLE PHRASE:*

Traditional solvents tend to be either...

...  
...

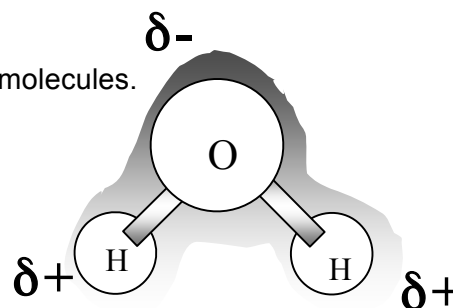
- Polar covalent solvents have an unequal charge distribution...

⊗  
ex)



**SOLVATION:**

- As ions dissolve they spread out and become surrounded by solvent molecules.
- The bigger the ion:
- The higher the charge on the ion:
- **HYDRATED:**

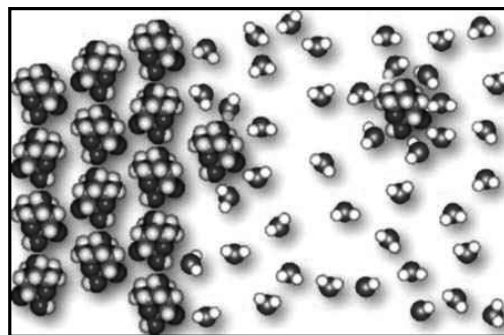


You don't need to be an ion to be dissolved in a polar solvent!

ex)

Which are the water molecules?

Which are the sugar molecules?



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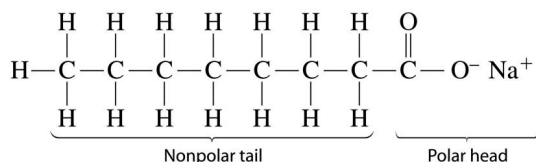
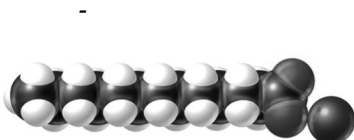
- Since non-polar covalent solvents have an equal charge distribution they...

...

...

...

ex) Dry cleaners use non-polar solvents to remove stains.



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**DETERGENTS WORK BECAUSE THEY HAVE...**

...a non-polar part which will interact...

... and a polar part which will interact...

## NOW THE CUTTING EDGE STUFF... IONIC LIQUIDS:

Normally ions pack closely into solid, crystalline structures due to...

**What if bulky, asymmetrical cations were combined with smaller, evenly shaped anions?**

- The ions don't pack well and remain disorganized. In other words, \_\_\_\_\_
- Unlike typical organic solvents, tend not to give off fumes due to \_\_\_\_\_
- Potentially less hazardous and more convenient than current solvents.
- Can easily extract chemicals from the ionic liquids, allowing...

**IONIC LIQUIDS HAVE THE POTENTIAL TO  
REDEFINE THE ENTIRE FIELD OF CHEMISTRY.**



*"Ideas are the factors that lift civilization. They create revolutions.  
There is more dynamite in an idea than in many bombs." ~ Bishop Vincent*