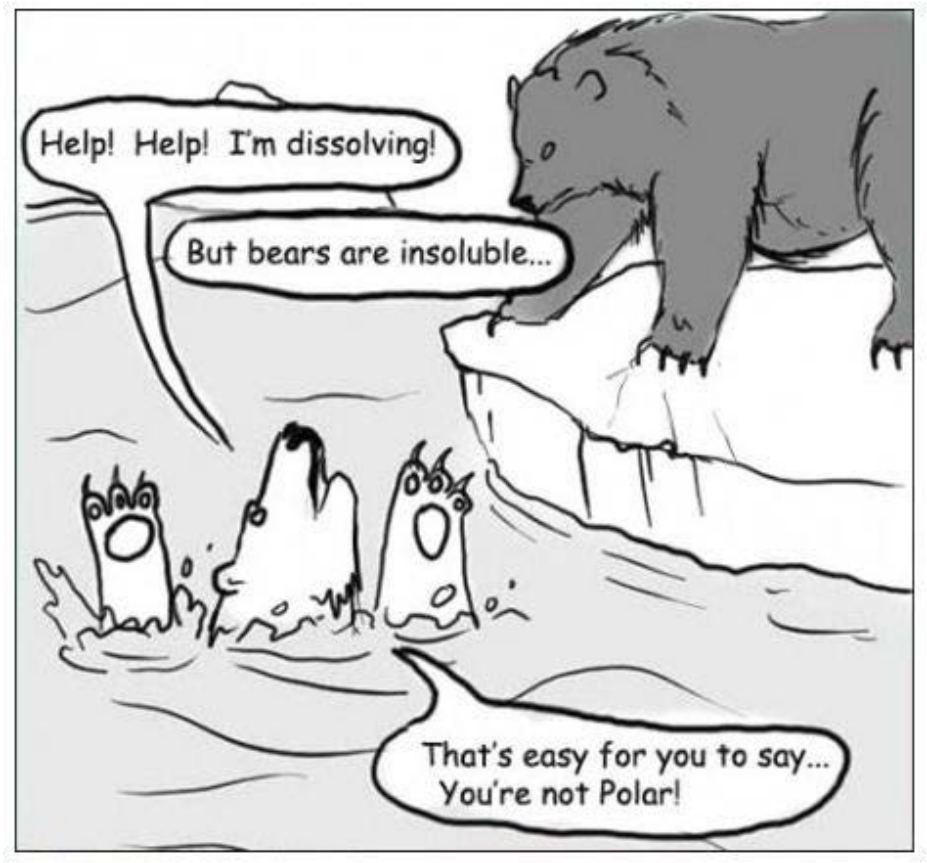
Solubility of Different Substances



http://iwastesomuchtime.com/43473

Outcomes:

- Describe the structure of water in terms of electronegativity and the polarity of its chemical bonds.
- Explain the solution process of simple ionic & covalent compounds.
- Perform a lab to illustrate formation of solutions in terms of polar & non polar

Ionic vs.Covalent:

Remember…

1. Ionic Compounds:

- Any substance formed by an **IONIC** bond, usually made of a **METAL** & a **NON-METAL**.
- When **DISSOLVED** in solution, they **DISSOCIATE**
  → release **POSITIVE** & **NEGATIVE IONS**
  Ex) $NaCl_{(s)} \rightarrow Na^{+}_{(aq)} + Cl^{-}_{(aq)}$

- Solution is an **ELECTROLYTE** → **CONDUCTS ELECTRICITY**.

2. Covalent Compounds:

- When dissolved, **DOES NOT DISSOCIATE** into ions.
  → **PARTICLES** are simply **SURROUNDED** by **SOLVENT PARTICLES** (solvated)
  Ex) $C_6H_{12}O_{6\,(s)} \rightarrow C_6H_{12}O_{6\,(aq)}$

- Are **NON-ELECTROLYTES**

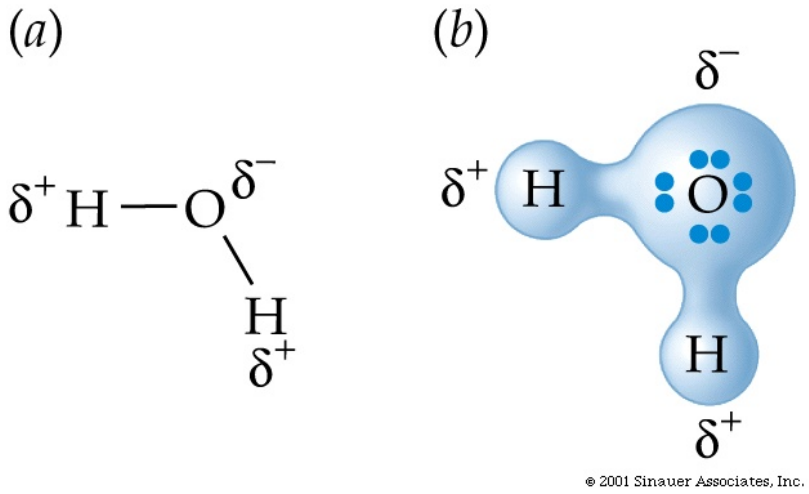
Note the difference between the terms **DISSOLVE** and **DISSOCIATE**!

Polar Molecules:

Now that we know about electronegativity, we can identify a third type of compound → **POLAR**!

Polar Molecules:

- Are not ionic or covalent, but are somewhere in **BETWEEN**
- Molecules that are bonded by an **UNEVEN SHARING** of electrons.
  - Some atoms have a stronger "**PULL**" on **ELECTRONS**, called **ELECTRONEGATIVITY.**
  - In water, the **SHARED ELECTRONS** are pulled **CLOSER** to the **OXYGEN** atom, making it **SLIGHTLY** more **NEGATIVE** (and hydrogen more positive)
  - This separation of charge is called a **DIPOLE**, and the result is water being a **POLAR SOLVENT.**



http://www.columbia.edu/cu/biology/courses/c2005/lectures/lec2_10.html

Non-Polar Molecules:

Non-Polar Substances:

- A molecule with atoms that have **SIMILAR ELECTRONEGATIVITIES**.
- Does **NOT** have specifically **CHARGED POLES**, are purely covalent.
  Ex) oil, carbon tetrachloride.

Dissolving process with polar and non-polar:

Dissolving Polar & Non-Polar

Solubility Rules:

Solvent-Solute Combinations

Solute	Solvent	What Happens	Result
Polar	**Polar**	The two polar solvent and solute are attracted to each other	Will dissolve
Non-polar	**Non-Polar**	Since both are non-polar, there are no attractions to break	Will dissolve
Polar	**Non-Polar**	The polar solute molecules are attracted to each other more than the non-polar solvent	Will not dissolve
Non-Polar	**Polar**	The polar solvent molecules are attracted to each other more than the non-polar solute	Will not dissolve

If we look at the above trend, we can say that generally:

"LIKE DISSOLVES LIKE"