IF YOU'RE NOT PART OF THE SOLUTION

YOU'RE PART OF THE PRECIPITATE
I) Ionic & Covalent Solutions

What is a solution?

What are some examples of different types solutions?

Solid-solid: metal alloys (steel, brass)  
Liquid-solid: salt water  
Liquid-liquid: gas + alcohol + water  
Liquid-gas: pop/soda; sparkling water (CO₂ = carbonated bev.)  
Gas-gas: air

Solutions are made up of solute(s) and a solvent. Define each:

Solute: the component of the solution in the lesser amount  
(S. solid being dissolved)

Solvent: the component of the solution in the greater quantity  
(e.g., “doing the dissolving”, most often H₂O)

http://www.mhhe.com/physsci/chemistry/animations/chang_2e/molecular_view.swf
What is the difference between an ionic solution and a covalent solution?

How does a solid salt such as NaCl\(_{(s)}\) dissolve in water? What is the difference between dissolving and dissociation? Why is NaCl\(_{(s)}\) commonly used to depict table salt in solution (after dissociation has occurred)?

Example dissociation equation for a salt: NaCl\(_{(s)}\) \(\rightarrow\) Na\(^+\)(aq) + Cl\(^-\)(aq)

*In the solubility unit, always include states when writing equations*

Compounds that contain polyatomic ions are obviously ionic in nature (they are salts) and would dissociate in water to form ions.

Write the dissociation equation for K\(_2\)CO\(_3\)(s) dissolving in water:

\[
K_2CO_3(s) \rightarrow 2K^+(aq) + CO_3^{2-}(aq)
\]

Ions in solution are called electrolytes. They are what allow an ionic solution to conduct electricity.
Ions in solution are called __________________. They are what allow an ionic solution to _______________.

What is a covalent compound (also called ‘molecular compound’) composed of?

- non-metals
- share electrons
- sometimes polar
- neutral (no charge)

What is different about covalent compounds when they dissolve compared to ionic compounds?

https://www.youtube.com/watch?v=fwjvwoFHTbg

Due to the strong attraction between the polar water molecules and the polar sugar molecules, the water molecules are able to pull the outer sugar molecules away from the sugar crystal.

**Diagram of a covalent compound (sugar in this case) dissolving in water:**

Covalent compounds may dissolve in water (if they are polar); but they do so as entire molecules. They do not dissociate like ionic compounds do.
Write the dissolving equation for the covalent sugar compound:
\[ \text{C}_6\text{H}_{12}\text{O}_6(s) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) \]

Write the dissolving equation for CH\(_3\)OH (methanol) in water:
\[ \text{CH}_3\text{OH}(\text{aq}) \rightarrow \text{CH}_3\text{OH}(\text{aq}) \]

Do molecular (covalent) solutions conduct? Why or why not?
No, because covalent compounds are neutral, therefore there will be no charged ions in solution.

What do we call dissolved molecular compounds?
non-electrolytes.

How can you tell the difference between ionic and covalent compounds?
Metal(s) + non-metals

\[ \text{e.g. NaCl} \]
\[ \text{NH}_4^+ \]
\[ \text{K}_2\text{CO}_3 \]

\[ \text{LD}^{2+} \text{ non-metals} \]

\[ \text{e.g. CuH}_2\text{O}_6 \]
\[ \text{CH}_3\text{OH} \]