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Solvent Polarity

In order to understand WHY salts dissolve in water, we have to first understand solvent polarity.

The following video explains why water (a solvent) is polar.

[http://www.youtube.com/watch?v=O27vCLv3Y7c&feature=player_embedded]

- We learned that salt is made up of cations and anions.
- Due to the polar characteristic of water, this explains why salt dissolves!
    - The partially negatively charged oxygen end (of water) is attracted to the cation and the partially positively charged hydrogen ends (of water) are attracted to the anion.
    - They are then able to pull the cation and anion apart, causing dissociation.

Here is a demonstration of the attraction of water to a charge!

[http://www.youtube.com/watch?v=IUIGu9s95Tw&feature=player_embedded]

- Because of the static charge on the surface of the balloon, the partially charged (polar) water molecules are attracted, hence the bending of the stream of water towards the balloon.

- Since the hexane is non-polar, meaning it does not have an overall partial charge to it, there is *nothing* that is attracting it to the static charge present on the surface of the balloon. That is why you don't see the stream of hexane bending, like in the case with water.

Extra Challenge!

So what happens when a polar and non-polar solvent are mixed together?

Separate phases are formed due to polarity and density

-You deal with density is everyday life. For example: think about when you add ice cubes into a drink. The ice cube is less dense than the solution it's in, so that's why ice cubes float on top.

-You deal with different polarities of "solvents" when you eat! When you add an oil and vinegar dressing on your salad, you typically have shake it well before pouring to mix the two layers together. Why do you do that?

- It's because the dressing is in two layers (the two different polarities of the vinegar and oil causes them to be in separate layers). After you use the shaken dressing and left it sitting on the table, you will again see the two different layers forming.
- It will naturally form the two distinct layers because of polarity difference and the oil will always be on the top layer because it is less dense than the vinegar.