

What's in the Water?

A solution is a type of mixture. It consists of two or more kinds of matter each of which retains its own properties. But it is homogeneous. It appears to be only one substance. This is what distinguishes solutions from mechanical mixtures. The substance that is dissolved is the solute. The solvent is the substance that dissolves the solute. It is the continuous phase. For example, salt dissolved in water appears to be a liquid.

Different solutes dissolve best in different solvents. In order for a solvent to dissolve a solute, it must exert forces of attraction on the solute. Polar solvents such as water dissolve polar and ionic solutes well because they exert mutual attractions that cause their particles to intermingle. Of course, not all ionic substances dissolve equally well in water. (See *Table F - Table of Solubilities in Water*) Nonpolar solvents do NOT dissolve polar and ionic substances because there is no attraction between them. For example, oil and water do NOT mix. Nonpolar substances such as fat dissolve in nonpolar solvents such as benzene because the forces of attraction are too weak to prevent the particles from freely intermingling.



Water discusses its tastes.

Answer the questions below based on your reading and on your knowledge of chemistry.

- Water is mixed with sugar, resulting in a transparent, colorless liquid.
 - What evidence will there be that this is a mixture rather than a new compound? _____

 - What evidence shows it is a solution rather than a mechanical mixture? _____

 - Which is the solute, and which is the solvent? How do you know? _____

- Why does table salt dissolve in water, while oil and water don't mix? _____

- Based on *Table F* indicate which of the following compounds is water soluble and which is insoluble?

a. Li_2CO_3 _____	e. $(\text{NH}_4)_3\text{PO}_4$ _____	i. CuSO_4 _____
b. $\text{Fe}(\text{OH})_3$ _____	f. $\text{Al}(\text{ClO}_3)_3$ _____	j. KNO_3 _____
c. CaCrO_4 _____	g. PbSO_4 _____	k. AgCl _____
d. BaS _____	h. NaOH _____	l. $\text{Ba}(\text{HCO}_3)_2$ _____