

SOLUBILITY OF IONIC COMPOUND

One of the other general properties of ionic compounds is that they often have some solubility in water. The oceans, of course, are saltwater. In a mixture, two or more materials are mixed together but they remain essentially separate, like sand and water. You can still easily tell the difference between the sand and the water, because even if you shake them up they will separate again on their own.

In a mixture, two or more materials are mixed together but they remain essentially separate, like sand and water. You can still easily tell the difference between the sand and the water, because even if you shake them up they will separate again on their own.

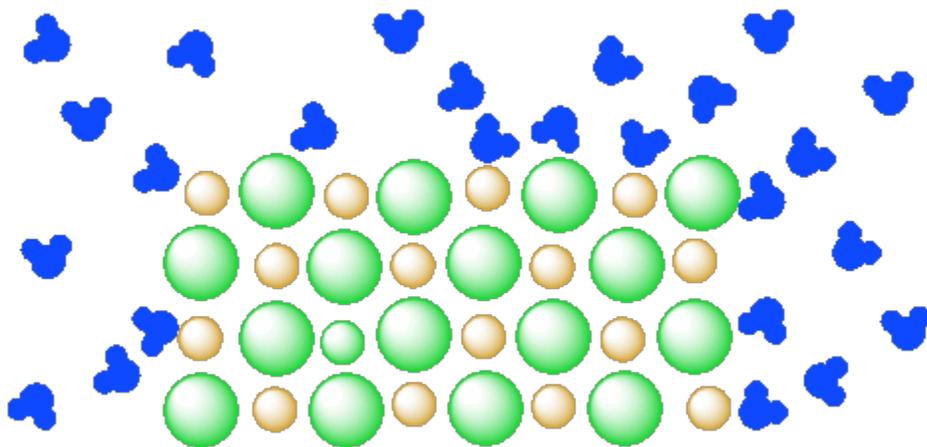


Figure IC4.1. A mixture of an insoluble salt (orange and green ions) and water (blue molecules). The two components remain separate from each other.

In a suspension, one or more materials is mixed into a liquid, and the mixture becomes somewhat homogeneous. Instead of having easily identifiable layers, the liquid looks the same throughout. However, suspensions are generally cloudy liquids. Milk is a suspension. It contains water, fats and proteins. They may settle out into separate layers eventually, but it takes time.

In a solution, one or more materials is mixed into a liquid, and the mixture becomes a completely homogeneous liquid. Solutions are transparent, not cloudy. They may be coloured or colourless, but you can always see through them. Saltwater is a solution.

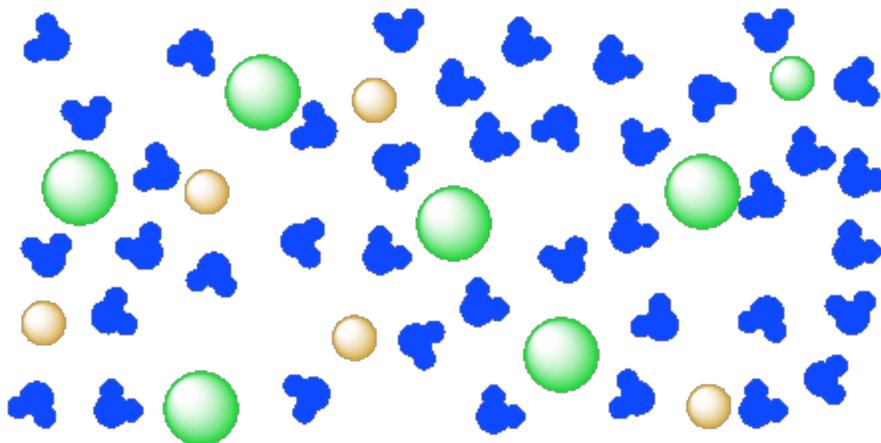


Figure IC4.2. A solution of a salt (orange and green ions) in water (blue molecules). The ions of the salt are completely distributed throughout the water.

You can't see chunks of salt in the solution because the salt particles are too small for you to see. The salt is separated into individual ions, surrounded by water molecules.

Of course, if you put some salt in water, it might not dissolve right away. You might have to stir it for a while.

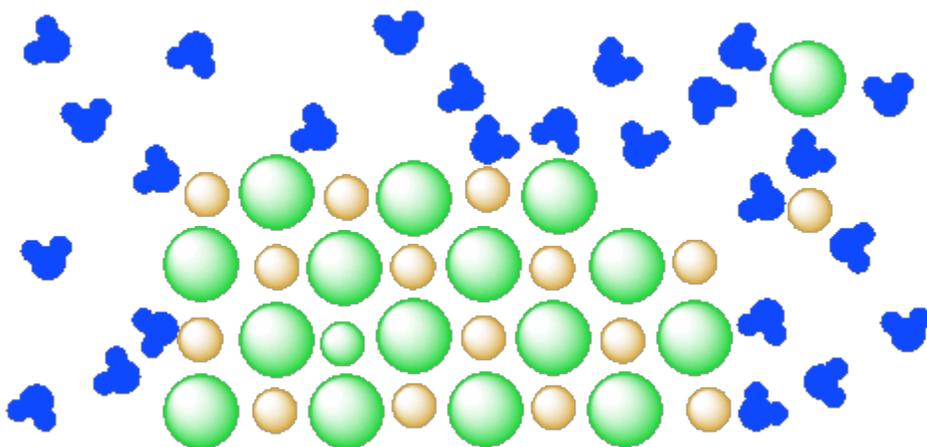


Figure IC4.3. A mixture of a salt (orange and green ions) and water (blue molecules). The salt is beginning to dissolve in the water.

Eventually more of the salt would dissolve in the water.

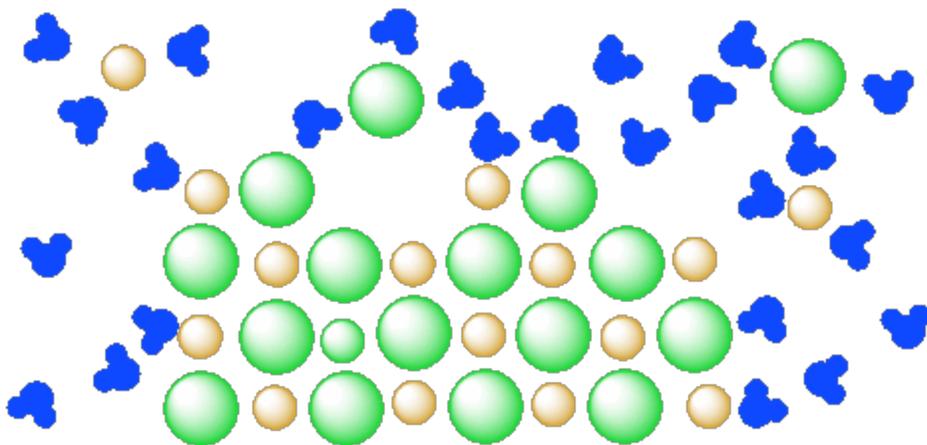


Figure IC4.4. A mixture of a salt (orange and green ions) and water (blue molecules). The salt continues to dissolve in the water.

However, at some point, the system might come to "equilibrium": the water has dissolved all of the salt that it can, so the rest of the salt stays solid. This equilibrium may be "dynamic": different ions may become dissolved in the water or may be deposited from solution into the solid state. However, the overall ratio of dissolved ions to water stays the same.

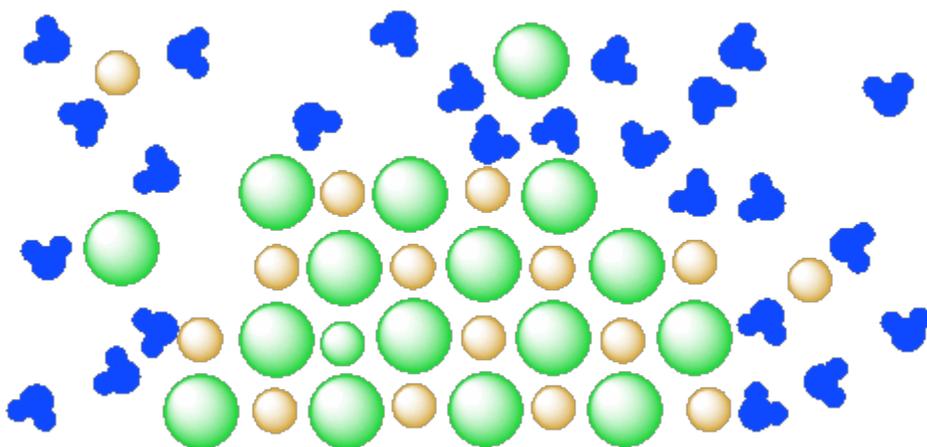


Figure IC4.3. A mixture of a salt (orange and green ions) and water (blue molecules). The salt is partly dissolved in the water but has reached equilibrium.