Question #61127, Chemistry / Physical Chemistry | completed

***Question*:** Briefly discuss the factors affecting solubility of gases in liquids.

Answer: The main factors are:

Molecular interactions. Gases dissolve into liquids because the molecules of each substance attract the other; the stronger the attraction, the more gas that can dissolve. The strength of the attraction depends on both the liquid and the gas; to some degree, large and heavy gas molecules dissolve more readily than small, light ones. Polarity of the gas and the solvent also affect the solubility. Water, for example, dissolves more than twice as much oxygen gas as it does nitrogen. Ammonia dissolves in water very good because the new compound is formed (NH_3 x H_2O).

Liquid pressure. As the pressure on a liquid increases, it dissolves greater amounts of gas; high pressures "force" gas molecules into the liquid. When you open a carbonated drink, you release the pressure the container was put under at the bottling plant - the liquid can no longer dissolve the carbon dioxide gas and the gas bubbles out vigorously.

Liquid temperature. The greater the temperature of a liquid, generally, the less gas can dissolve into it. Reduce the temperature of the liquid, and it tends to absorb more gas. Thermal pollution, a problem that occurs near power plants, is the result of water used to cool industrial equipment. Once discharged back into a lake or river, it is warmer and cannot hold as much dissolved oxygen, making the water less livable for fish and other aquatic life.