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Evaporation

From Wikipedia, the free encyclopedia

Theory

For molecules of a liquid to evaporate, they must be located near the surface, be moving in the proper direction, and have sufficient kinetic energy to overcome liquid-phase intermolecular forces.[1] When only a small proportion of the molecules meet these criteria, the rate of evaporation is low. Since the kinetic energy of a molecule is proportional to its temperature, evaporation proceeds more quickly at higher temperatures. As the faster-moving molecules escape, the remaining molecules have lower average kinetic energy, and the temperature of the liquid decreases. This phenomenon is also called **evaporative cooling**. This is why evaporating sweat cools the human body.

Examples of the temperature drop

Flow rate of air

> This is in part related to the concentration points above. If fresh air is moving over the substance all the time, then the concentration of the substance in the air is less likely to go up with time, thus encouraging faster evaporation

- At (90 °F) and 15% relative humidity, air may be cooled to nearly (61 °F).
- At (90 °F) and 50% relative humidity, air may be cooled to about (75 °F).

(*Cooling examples extracted from the June 25, 2000 University of Idaho publication, "Homewise"*).