

Diffusion Encyclopedia Article

Diffusion

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Diffusion

Diffusion is a process in which the random motion of molecules or other particles results in a net movement from a region of high concentration to a region of lower concentration. Familiar examples include the spread of tobacco smoke throughout the still air of an auditorium, or the dissemination of floral perfumes from a bouquet to all parts of the motionless air of a room. The rate of flow of the diffusing substance is proportional to the concentration gradient for a given direction of diffusion. Thus, if the concentration of the diffusing substance is very high at the source, and is diffusing in a direction where little or none is found, the diffusion rate will be maximized. Several substances may diffuse more or less independently and simultaneously within a space. Thus, in the examples mentioned earlier, tobacco smoke may diffuse throughout a room at the same time as the floral scent spreads. Because lightweight molecules have higher average speeds than heavy molecules at the same temperature, they also tend to diffuse more rapidly. Molecules of the same weight move more rapidly at higher temperatures increasing the rate of diffusion as the temperature rises.