

differential diffusion coefficient

Defined by

$$D_i = -\mathbf{J}_i/\mathbf{grad} c_i$$

where \mathbf{J}_i is the amount of species i flowing through unit area in unit time and $\mathbf{grad} c_i$ is the concentration gradient of species i . Different diffusion coefficients may be defined depending on the choice of the frame of reference used for \mathbf{J}_i and $\mathbf{grad} c_i$. For systems with more than two components, the flow of any component and hence its diffusion coefficient depends on the concentration distribution of all components.

The limiting differential diffusion coefficient is the value of D_i extrapolated to zero concentration of the diffusing species:

$$[D_i] = \lim_{c_i \rightarrow 0} D_i$$

1972, 31, 617