

## differential diffusion coefficient

**Also contains definition of:** limiting differential diffusion coefficient

Defined by

$$D_i = \frac{-J_i}{\nabla c_i}$$

where  $J_i$  is the amount of species  $i$  flowing through unit area in unit time and  $\nabla c_i$  is the concentration gradient of species  $i$ . Different diffusion coefficients may be defined depending on the choice of the frame of reference used for  $J_i$  and  $\nabla c_i$ . 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:

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

**Source:**

PAC, 1972, 31, 577 (*Manual of Symbols and Terminology for Physicochemical Quantities and Units, Appendix II: Definitions, Terminology and Symbols in Colloid and Surface Chemistry*) on page 617