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fractional selectivity

in catalysis

The term selectivity (S) is used to describe the relative rates of two or more competing reactions on a catalyst. Such competition includes cases of different reactants undergoing simultaneous reactions or of a single reactant taking part in two or more reactions. For the latter case, S may be defined in two ways. The first of these defines a fractional selectivity, S_F, for each product by the equation

$$S_F = \frac{\xi_i}{\sum \xi_i}$$

The second defines relative selectivities, S_R, for each pair of products by

$$S_R = \frac{\xi_i}{\xi_j}$$

In each case, ξ_i and ξ_j are the rates of increase of the extent of reactions i and j respectively, i.e.

$$\xi_i = \frac{d\xi_i}{dt}$$

and

$$\xi_j = \frac{d\xi_j}{dt},$$

where ξ_i and ξ_j are the extents of reactions i and j respectively.

Source:

PAC, 1976, *46*, 71 *(Manual of Symbols and Terminology for Physicochemical Quantities and Units - Appendix II. Definitions, Terminology and Symbols in Colloid and Surface Chemistry. Part II: Heterogeneous Catalysis)* on page 81

