partial rate factor

The rate of substitution at one specific site in an aromatic compound relative to the rate of substitution at one position in benzene. For example, the partial rate factor f_p^Z for *para*-substitution in a monosubstituted benzene C_6H_5Z is related to the rate constants $k(C_6H_5Z)$ and $k(C_6H_6)$ for the total reaction (i.e. at all positions) of C_6H_5Z and benzene, respectively, and *% para* (the percentage *para*-substitution in the total product formed from C_6H_5Z) by the relation:

$$f_p^Z = \frac{6\,k(C_6H_5Z)}{k(C_6H_6)}\,\frac{\%\ \text{para}}{100}$$

Similarly for *meta*-substitution:

$$f_m^Z = \frac{6\,k(C_6H_5Z)}{2\,k(C_6H_6)}\,\frac{\%\ \text{meta}}{100}$$

(The symbols p_f^Z, m_f^Z, o_f^Z are also in use.) The term applies equally to the *ipso* position, and it can be extended to other substituted substrates undergoing parallel reactions at different sites with the same reagent according to the same rate law.
See also: selectivity

Source:
PAC, 1994, *66*, 1077 *(Glossary of terms used in physical organic chemistry (IUPAC Recommendations 1994))* on page 1149