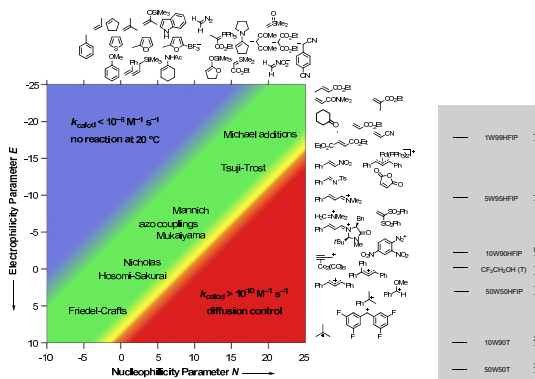


Reactivity Scales

v2021/09



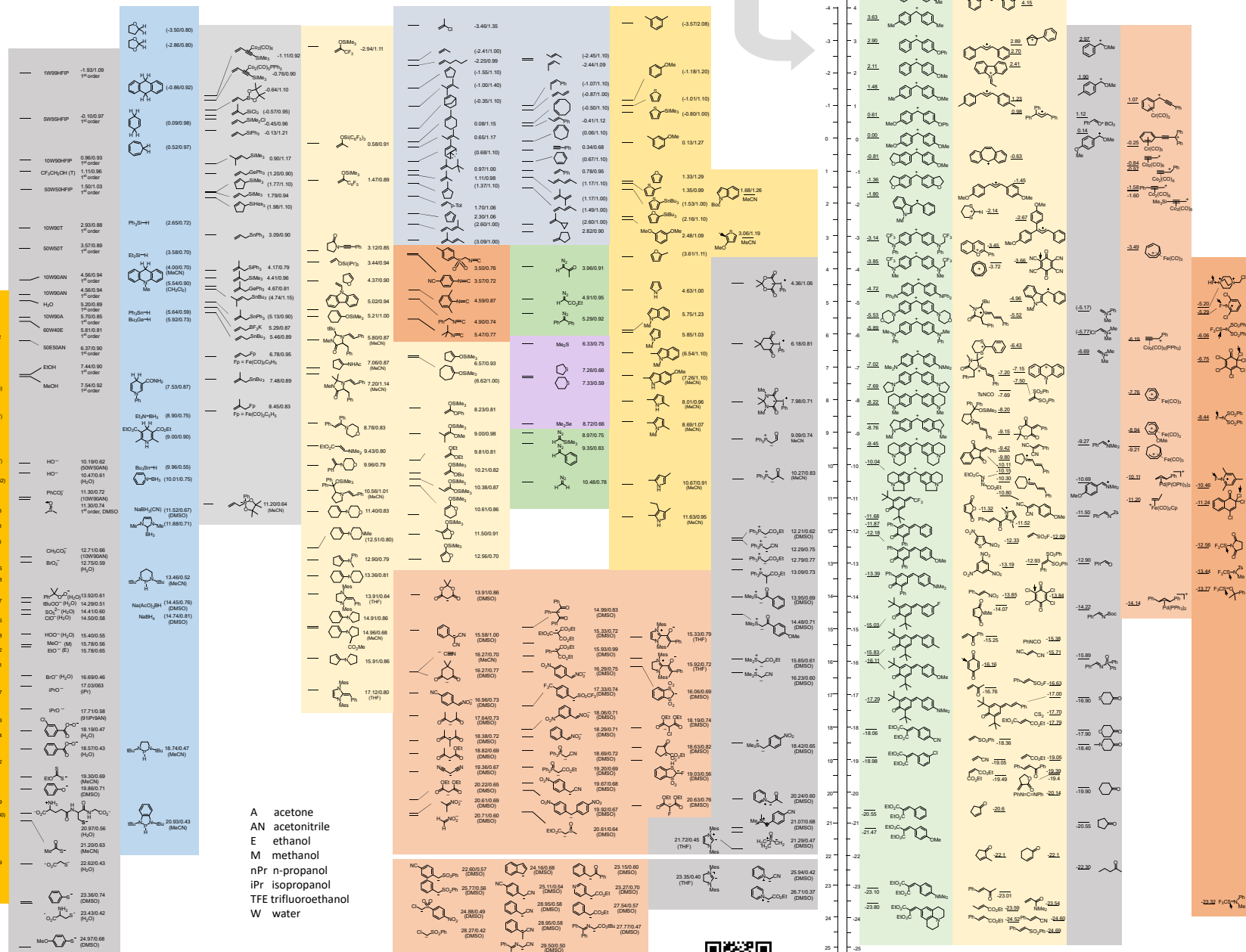
The reactivity poster shows a selection of the published reactivity parameters E , N , and S_N which allow the calculation of the rate constants for combination reactions of electrophiles with nucleophiles, with the following equation:

$$\log k_{20^\circ\text{C}} = S_N(N + E)$$

E = electrophilicity parameter
 N = nucleophilicity parameter
 S_N = nucleophile-specific sensitivity parameter (N and S_N are solvent-dependent; solvent is CH_2Cl_2 if not mentioned otherwise)

How to read the scales:

- Nucleophiles and electrophiles located on the same level ($E + N = 0$) combine with rate constants of $k = 1 \text{ M}^{-1} \text{ s}^{-1}$ at 20 °C, corresponding to half-reaction times of 10 seconds for 0.1 M solutions.
- At 20 °C electrophiles will generally not react with nucleophiles positioned more than 5 units higher.
- Electrophiles will generally undergo diffusion controlled (often unselective) reactions with nucleophiles positioned more than 9 units lower.



Nucleophiles

Further reactivity parameters are accessible at:
www.cup.lmu.de/oc/mayr/DBintro.html



Electrophiles

Get your free pdf of Mayr's Reactivity Scales Poster at:
www.cup.lmu.de/oc/mayr/MayrPoster.html