# REACTIVITY ($N$, $s_N$) OF P-, O- AND N-NUCLEOPHILES

$$\log k_{20°C} = s_N(N + E)$$

in $CH_2Cl_2$
if not mentioned otherwise

## P-Nucleophiles

$P(OPh)_3$ 5.51/0.76

$P(OMe)_3$ 9.04/0.70 (91M9AN)

$P(OC_4H_9)_3$ 10.36/0.70

12.58/0.65

13.37/0.70

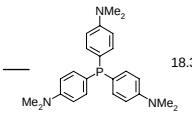
$P(C_6H_5)_3$ 14.33/0.65

14.64/0.68

$P(4\text{-Me-}C_6H_4)_3$ 15.44/0.64

$PBu_3$ 15.49/0.69

$P(4\text{-MeO-}C_6H_4)_3$ 16.17/0.62


18.39/0.64

## O-Nucleophiles

$CF_3CH_2OH$ (T) 1.23/0.92 1st order

10W90T 2.93/0.88 1st order

50W50T 3.57/0.89 1st order

10W90AN 4.56/0.94 1st order

10W90AN 4.56/0.94 1st order

$H_2O$ 5.20/0.89 1st order

10W90A 5.70/0.85 1st order

60W40E 5.81/0.81 1st order

50E50AN 6.37/0.90 1st order

EtOH 7.44/0.90 1st order

MeOH 7.54/0.92 1st order

$HO^-$ 10.19/0.62 (50W50AN)

$HO^-$ 10.47/0.61 ($H_2O$)

11.30/0.74 1st order

$CH_3O^-$ 14.51/0.68 (91M9AN)

$HOO^-$ 15.40/0.55 ($H_2O$)

$CH_3O^-$ 15.78/0.56 (M)

$EtO^-$ 15.78/0.65 (E)

$nPrO^-$ 16.03/0.70 (nPr)

$EtO^-$ 16.08/0.62 (91E9AN)

$nPrO^-$ 16.73/0.63 (91nPr9AN)

$iPrO^-$ 17.03/063 (iPr)

$iPrO^-$ 17.71/0.58 (91iPr9AN)

## N-Nucleophiles

(7.69/0.76) (MeCN)

(7.77/0.76) (MeCN)

9.45/0.54 ($H_2O$)

$NH_3$ 9.48/0.59 ($H_2O$)

(10.50/0.73) ($H_2O$)

11.05/0.73 ($H_2O$)

(11.70/0.67)

11.44/0.68 ($H_2O$)

11.90/0.73 ($H_2O$)

(12.90/0.67)

13.19/0.56

Gly⁻ ($H_2O$) 13.51/0.58 ($H_2O$)

(13.70/0.67)

14.30/0.67 (DMSO)

14.68/0.53 ($H_2O$)

15.29/0.70 (MeCN)

15.62/0.54 ($H_2O$)

15.70/0.64 (DMSO)

16.28/0.67 (MeCN)

17.19/0.71 (DMSO)

16.96/0.67 (DMSO)

18.08/0.50 ($H_2O$)

18.13/0.44 ($H_2O$)

18.80/0.70 (MeCN)

18.97/0.62 (DMSO)

19.917/0.60 (DMSO)

20.50/0.59 (DMSO)
20.54/0.60 (MeCN)

22.40/0.59 (DMSO)

22.67/0.54 (DMSO)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

$N$

| | |
|---|---|
| A | acetone |
| AN | acetonitrile |
| E | ethanol |
| M | methanol |
| nPr | n-propanol |
| iPr | iso-propanol |
| TFE | trifluoroethanol |
| W | water |

further reactivity parameters: http://www.cup.lmu.de/oc/mayr/DBintro.html