

For the synthetic chemists: When does it make sense to try a reaction?

Half-times for a uni-molecular reaction at 298K (25 °C)

ΔG^\ddagger kcal/mol	ΔG^\ddagger kJ/mol	$t_{1/2}$ in sec	$t_{1/2}$ in h	$t_{1/2}$ in years
5	20,92	4,68791E-10	1,3022E-13	1,49335E-17
10	41,84	1,97002E-06	5,4723E-10	6,27555E-14
15	62,76	0,008278702	2,2996E-06	2,6372E-10
20	83,68	34,78992782	0,00966387	1,10824E-06
25	104,6	146199,1344	40,6108707	0,00465721
30	125,52	614378592,5	170660,72	19,5711835
35	146,44	2,58183E+12	717174513	82244,78365
40	167,36	1,08497E+16	3,0138E+12	345620612,9
45	188,28	4,55942E+19	1,2665E+16	1,45242E+12
50	209,2	1,91602E+23	5,3223E+19	6,10355E+15

Half-times for a uni-molecular reaction at 373K (100 °C)

ΔG^\ddagger kcal/mol	ΔG^\ddagger kJ/mol	$t_{1/2}$ in sec	$t_{1/2}$ in h	$t_{1/2}$ in years
5	20,92	7,00038E-11	1,9446E-14	2,22999E-18
10	41,84	5,49577E-08	1,5266E-11	1,75069E-15
15	62,76	4,31456E-05	1,1985E-08	1,37441E-12
20	83,68	0,033872197	9,4089E-06	1,07901E-09
25	104,6	26,5919755	0,00738666	8,47094E-07
30	125,52	20876,50718	5,79902977	0,000665026
35	146,44	16389476,3	4552,6323	0,522090861
40	167,36	12866852243	3574125,62	409,8767916
45	188,28	1,01014E+13	2805931408	321781,1247
50	209,2	7,93025E+15	2,2028E+12	252620041,8