

Appendix F:

Estimates of Gas-phase Lifetimes for Selected Substances

Table F.1. Estimates of gas-phase lifetimes for selected substances.

No.	Chemical	CAS No.	Gas-Phase Removal Process	k_{OH} (cm^3 molecule ⁻¹ s ⁻¹)	k_{NO_3} (cm^3 molecule ⁻¹ s ⁻¹)	k_{O_3} (cm^3 molecule ⁻¹ s ⁻¹)	记录的半衰期 (天) Reported Gas-Phase Lifetime (days)	计算的半衰期 (天) Calculated Gas-Phase Hal- Life (days)
1	乙醛 Acetaldehyde	75-07-0	OH, photolysis	15.8×10^{-12}	-	-	<1	1.06
6	丙烯醛 Acrolein	107-02-8	OH, photolysis, O ₃	19.9×10^{-12}	-	3.0×10^{-14}	<1	32 sec
9	丙烯腈 Acrylonitrile	107-13-1	OH	-	-	-	1-5 to >5	-
10	烯丙基氯 Allyl chloride	107-05-1		-	-	1.60×10^{-18}	-	-
12	苯胺 Aniline	62-53-3		-	-	1.12×10^{-18}	-	-
14	苯 Benzene	71-43-2	OH, NO ₃	1.23×10^{-12}	-	1.7×10^{-22}	>5	14
17	氯化苄 Benzyl chloride	100-44-7		-	-	$<6 \times 10^{-20}$	-	-
22	1,3-二丁烯 1,3-Butadiene	106-99-0	OH, O ₃	66.6×10^{-12}	-	6.3×10^{-18}	<1	0.22
27	四氯化碳 Carbon tetrachloride	56-23-5	Photolysis (in stratosphere)	-	-	-	-	-
37	三氯甲烷 Chloroform	67-66-3	OH	-	-	-	>5	-
40	邻甲苯酚 <i>o</i> -Cresol	95-48-7		4.2×10^{-11}	1.37×10^{-11}	2.6×10^{-19}	-	-
41	间甲酚 <i>m</i> -Cresol	108-39-4		6.4×10^{-11}	9.74×10^{-12}	1.9×10^{-19}	-	-
42	对甲酚 <i>p</i> -Cresol	106-44-5		4.7×10^{-11}	1.07×10^{-11}	4.7×10^{-19}	-	-
44	异丙基苯 Cumene	98-82-8		6.5×10^{-12}	-	-	-	-
54	反式-1,3-二氯丙烯 <i>trans</i> -1,3- Dichloropropene	542-75-6	OH, O ₃	-	-	-	<1	-
57	硫酸二乙酯 Diethyl sulfate	64-67-5		1.81×10^{-12}	-	-	-	-
61	N,N-二甲基苯胺 N,N-Dimethylaniline	121-69-7		-	-	9.1×10^{-18}	-	-
67	硫酸二甲酯 Dimethyl sulfate	77-78-1		$<0.5 \times 10^{-12}$	-	-	-	-
74	1,2-环氧丁烷 1,2-Epoxybutane	106-88-7		1.91×10^{-12}	-	-	-	-
76	乙基苯 Ethylbenzene	100-41-4		7.1×10^{-12}	-	-	-	-
78	乙基氯 Ethyl chloride	75-00-3		40.8×10^{-14}	-	-	-	-

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79	二溴乙烷 Ethylene dibromide	106-93-4		22.5×10^{-14}	-	-	-	74
80	1,2-二氯乙烷 Ethylene dichloride	107-06-2		26.4×10^{-14}	-	-	-	63
84	环氧乙烷 Ethylene oxide	75-21-8	OH	-	-	-	>5	-
87	甲醛 Formaldehyde	50-00-0	Photolysis, OH	9.37×10^{-12}	-	-	<1	1.8
89	六氯苯 Hexachlorobenzene	118-74-1	OH	-	-	-	>5	-
97	正己烷Hexane	110-54-3	-	5.61×10^{-12}	-	-	-	-

Table F.1. (Cont.).

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98	肼 Hydrazine	302-01-2	OH, O ₃	-	-	-	<1	-
102	甲醇 Methano	67-56-1		0.944 x 10 ⁻¹²	-	-	-	-
105	氯甲烷 Methyl chloride	74-87-3		5.3 x 10 ⁻¹⁴	-	-	-	-
106	1,1,1-三氯乙烷 Methyl chloroform	71-55-6		1.09 x 10 ⁻¹⁴	-	-	-	-
107	甲乙酮 Methyl ethyl ketone	78-93-3		1.15 x 10 ⁻¹²	-	-	-	-
109	碘甲烷 Methyl iodide	74-88-4		7.2 x 10 ⁻¹⁴	-	-	-	-
110	4-甲基-2-戊酮 Methyl isobutyl ketone	108-10-1		14.1 x 10 ⁻¹²	-	-	-	-
113	甲基叔丁基醚 Methyl tert-butyl ether	1634-04-4		2.94 x 10 ⁻¹²	-	-	-	-
115	二氯甲烷 Methylene chloride	75-09-2	OH	14.7 x 10 ⁻¹⁴	≤5.8 x 10 ⁻¹⁸	-	>5	114
118	萘 Naphthalene	91-20-3		-	-	<3 x 10 ⁻¹⁹	-	-
119	硝基苯 Nitrobenzene	98-95-3		-	-	<7 x 10 ⁻²¹	-	-
129	苯酚 Phenol	108-95-2		2.63 x 10 ⁻¹¹	3.92 x 10 ⁻¹²	-	-	-
131	氯代甲酰氯 Phosgene	75-44-5		<0.1 x 10 ⁻¹⁴	-	-	-	-
136	丙醛 Propionaldehyde	123-38-6		19.6 x 10 ⁻¹²	-	-	-	-
141	喹啉 Quinoline	91-22-5	OH	-	-	-	1 to 5	-
143	苯乙烯 Styrene	100-42-5		5.8 x 10 ⁻¹¹	1.5 x 10 ⁻¹³	1.71 x 10 ⁻¹⁷	-	-
146	四氯乙烷 1,1,2,2- Tetrachloroethane	79-34-5	OH	22.6 x 10 ⁻¹⁴	-	-	>5	74

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147	四氯乙烯 Tetrachloroethylene	127-18-4	OH	1.73×10^{-13}	$<1.8 \times 10^{-16}$	$\sim 2.8 \times 10^{-20}$	>5	97
148	甲苯 Toluene	108-88-3		5.96×10^{-12}	0.68×10^{-16}	4.1×10^{-22}	-	2.80
154	1,1,2-三氯乙烷 1,1,2-Trichloroethane	79-00-5		19.6×10^{-14}	-	-	-	-
155	三氯乙烯 Trichloroethylene	79-01-6	OH	1.76×10^{-12}	-	-	>5	9.5
160	2,2,4-三甲基戊烷 2,2,4-Trimethylpentane	540-84-1		3.59×10^{-12}	-	-	-	-
163	氯乙烯 Vinyl chloride	75-01-4	OH, O ₃	7.55×10^{-12}	-	-	<1 to 1-5	2.2
164	过氯乙烯 Vinylidene chloride	75-35-4		11.2×10^{-12}	-	-	-	-
165	邻二甲苯 o-Xylene	95-47-6		13.7×10^{-12}	3.8×10^{-16}	1.7×10^{-21}	-	1.22
166	间二甲苯 m-Xylene	108-38-3		23.6×10^{-12}	2.33×10^{-16}	8.5×10^{-22}	-	0.71
167	对二甲苯 p-Xylene	106-42-3		14.3×10^{-12}	4.5×10^{-16}	1.4×10^{-21}	-	1.17