

Table 2.1. *Residence times of some atmospheric gases^a*
(in many cases only very rough estimates are possible)

Gas	Residence Time
Nitrogen (N ₂)	1.6 × 10 ⁷ a
Helium (He)	10 ⁶ a
Oxygen (O ₂)	3,000–10,000 a
Carbon dioxide (CO ₂)	3–4 a
Nitrous oxide (N ₂ O)	150 a
Methane (CH ₄)	9 a
CFC-12 (CF ₂ Cl ₂)	>80 a
CFC-11 (CFCl ₃)	~80 a
Hydrogen (H ₂)	4–8 a
Methyl chloride (CH ₃ Cl)	2–3 a
Carbonyl sulfide (COS)	~2 a
Ozone (O ₃)	100 days
Carbon disulfide (CS ₂)	40 days
Carbon monoxide (CO)	~60 days
Water vapor ^b	~10 days
Formaldehyde (CH ₂ O)	5–10 days
Sulfur dioxide (SO ₂)	1 day
Ammonia + Ammonium (NH ₃ + NH ₄ ⁺)	2–10 days
Nitrogen dioxide (NO ₂)	0.5–2 days
Nitrogen oxide (NO)	0.5–2 days
Hydrogen chloride (HCl)	4 days
Hydrogen sulfide (H ₂ S)	1–5 days
Hydrogen peroxide (H ₂ O ₂)	1 day
Dimethyl sulfide (CH ₃ SCH ₃)	0.7 days

^aThe residence time (or lifetime) is defined as the amount of the chemical in the atmosphere divided by the rate at which the chemical is removed from the atmosphere. This time scale characterizes the rate of adjustment of the atmospheric concentration of the chemical if the emission rate is changed suddenly.

^bThe residence time of liquid water in clouds is ~6 h.