

Physical properties of selected gases

Chemical formula	Compound name	Molar mass [g/mol]	Density [g/l] (0°C, 101.325kPa)	Specific volume [m ³ /kg] (25°C, 101.325kPa)	Heat capacity ratio $\gamma = C_p/C_v$	Thermal conductivity [mW/(m ² K)] (0°C, 101.325kPa)	Solubility in water [l/l] (0°C, 101.325kPa)
N ₂	Nitrogen	28.014	1.250	0.8734	1.4013	24.001	0.0235
O ₂	Oxygen	31.998	1.428	0.7643	1.3967	24.350	0.0489
CO	Carbon monoxide	28.010	1.250	0.8734	1.4013	24.740	0.0352
NO	Nitric oxide	30.010	1.340	0.805	1.394	23.703	0.074
NO ₂	Nitrogen dioxide	46.006	2.051	0.512	1.31	12.961	
CO ₂	Carbon dioxide	44.010	1.974	0.5532	1.2941	14.674	1.7163
SO ₂	Sulphur dioxide	64.064	2.915	0.3754	1.2805	8.434	79.79
N ₂ O	Nitrous oxide	44.013	1.975	0.553	1.2804	16.464	1.14 ²⁾
H ₂ S	Hydrogen sulphide	34.076	1.533	0.7126	1.3310	15.609	4.67
CH ₄	Methane	16.040	0.717	1.5227	1.3062	30.570	0.054 ³⁾
C ₂ H ₆							
NH ₃	Ammonia	17.031	0.769	1.4218	1.3160	22.916	862
H ₂ O	Water (vapour)	18.015	0.804 ¹⁾	1.3349 ¹⁾	1.334	0.560	---
HCl	Hydrogen chloride	36.461	1.646	0.68	1.41	13.1577	506
Cl ₂	Chlorine	70.906	3.207	0.3360	1.33	7.910	4.61
H ₂	Hydrogen	2.016	0.0899	11.983	1.4054	172.580	0.0214
Air	Air – mixture of gases	28.800	1.292	0.8448	1.4018	24.360	0.0292

1) – hypothetical value for water vapour 2) – under temperature of 5°C 3) – under the temperature of 2°C

Flammability limits in air (at STP conditions – 0°C, 101.325kPa)

Chemical formula	Compound name	LFL / LEL ⁴⁾ [vol %]	UFL / UEL ⁵⁾ [vol %]	Autoignition temperature
CO	Carbon monoxide	12.5%	74%	609°C
CH ₄	Methane	4.4% ÷ 5.0%	15%	580°C
C ₂ H ₆	Ethane	3%	12% ÷ 12.4%	515°C
H ₂	Hydrogen	4.0%	75%	500 ÷ 571°C

4) – LEL = lower explosive level 2) – UEL = upper explosive level