

TABLE 6.2-1. *Diffusion Coefficients of Gases at 101.32 kPa Pressure*

System	Temperature		Diffusivity [(m ² /s)10 ⁶ or cm ² /s]	Ref.
	°C	K		
Air-NH ₃	0	273	0.198	(W1)
Air-H ₂ O	0	273	0.220	(N2)
	25	298	0.260	(L1)
	42	315	0.288	(M1)
Air-CO ₂	3	276	0.142	(H1)
	44	317	0.177	
Air-H ₂	0	273	0.611	(N2)
Air-C ₂ H ₅ OH	25	298	0.135	(M1)
	42	315	0.145	
Air-CH ₃ COOH	0	273	0.106	(N2)
Air- <i>n</i> -hexane	21	294	0.080	(C1)
Air-benzene	25	298	0.0962	(L1)
Air-toluene	25.9	298.9	0.086	(G1)
Air- <i>n</i> -butanol	0	273	0.0703	(N2)
	25.9	298.9	0.087	
H ₂ -CH ₄	25	298	0.726	(C2)
H ₂ -N ₂	25	298	0.784	(B1)
	85	358	1.052	
H ₂ -benzene	38.1	311.1	0.404	(H2)
H ₂ -Ar	22.4	295.4	0.83	(W2)
H ₂ -NH ₃	25	298	0.783	(B1)
H ₂ -SO ₂	50	323	0.61	(S1)
H ₂ -C ₂ H ₅ OH	67	340	0.586	(T1)
He-Ar	25	298	0.729	(S2)
He- <i>n</i> -butanol	150	423	0.587	(S2)
He-air	44	317	0.765	(H1)
He-CH ₄	25	298	0.675	(C2)
He-N ₂	25	298	0.687	(S2)
He-O ₂	25	298	0.729	(S2)
Ar-CH ₄	25	298	0.202	(C2)
CO ₂ -N ₂	25	298	0.167	(W3)
CO ₂ -O ₂	20	293	0.153	(W4)
N ₂ - <i>n</i> -butane	25	298	0.0960	(B2)
H ₂ O-CO ₂	34.3	307.3	0.202	(S3)
CO-N ₂	100	373	0.318	(A1)
CH ₃ Cl-SO ₂	30	303	0.0693	(C3)
(C ₂ H ₅) ₂ O-NH ₃	26.5	299.5	0.1078	(S4)

TABLE 6.3-1. Diffusion Coefficients for Dilute Liquid Solutions

Solute	Solvent	Temperature		Diffusivity [(m ² /s)10 ⁹ or (cm ² /s)10 ⁵]	Ref.
		°C	K		
NH ₃	Water	12	285	1.64	(N2)
		15	288	1.77	
O ₂	Water	18	291	1.98	(N2)
		25	298	2.41	(V1)
CO ₂	Water	25	298	2.00	(V1)
H ₂	Water	25	298	4.8	(V1)
Methyl alcohol	Water	15	288	1.26	(J1)
Ethyl alcohol	Water	10	283	0.84	(J1)
		25	298	1.24	(J1)
<i>n</i> -Propyl alcohol	Water	15	288	0.87	(J1)
Formic acid	Water	25	298	1.52	(B4)
Acetic acid	Water	9.7	282.7	0.769	(B4)
		25	298	1.26	(B4)
Propionic acid	Water	25	298	1.01	(B4)
HCl (9 g mol/liter) (2.5 g mol/liter)	Water	10	283	3.3	(N2)
		10	283	2.5	(N2)
Benzoic acid	Water	25	298	1.21	(C4)
Acetone	Water	25	298	1.28	(A2)
Acetic acid	Benzene	25	298	2.09	(C5)
Urea	Ethanol	12	285	0.54	(N2)
Water	Ethanol	25	298	1.13	(H4)
KCl	Water	25	298	1.870	(P2)
KCl	Ethylene glycol	25	298	0.119	(P2)

p431

TABLE 6.4-1. Diffusion Coefficients for Dilute Biological Solutes in Aqueous Solution

Solute	Temperature		Diffusivity (m ² /s)	Molecular Weight	Ref.
	°C	K			
Urea	20	293	1.20 × 10 ⁻⁹	60.1	(N2)
	25	298	1.378 × 10 ⁻⁹		(G5)
Glycerol	20	293	0.825 × 10 ⁻⁹	92.1	(G3)
Glycine	25	298	1.055 × 10 ⁻⁹	75.1	(L3)
Sodium caprylate	25	298	8.78 × 10 ⁻¹⁰	166.2	(G6)
Bovine serum albumin	25	298	6.81 × 10 ⁻¹¹	67 500	(C6)
Urease	25	298	4.01 × 10 ⁻¹¹	482 700	(C7)
	20	293	3.46 × 10 ⁻¹¹		(S6)
Soybean protein	20	293	2.91 × 10 ⁻¹¹	361 800	(S6)
Lipoxidase	20	293	5.59 × 10 ⁻¹¹	97 440	(S6)
Fibrinogen, human	20	293	1.98 × 10 ⁻¹¹	339 700	(S6)
Human serum albumin	20	293	5.93 × 10 ⁻¹¹	72 300	(S6)
γ-Globulin, human	20	293	4.00 × 10 ⁻¹¹	153 100	(S6)
Creatinine	37	310	1.08 × 10 ⁻⁹	113.1	(C8)
Sucrose	37	310	0.697 × 10 ⁻⁹	342.3	(C8)
	20	293	0.460 × 10 ⁻⁹		(P3)

p437