

Hines et. al,

TABLE 2-6. EXPERIMENTAL DIFFUSION COEFFICIENTS AT INFINITE DILUTION
(SHERWOOD ET AL., 1975)

<i>Solute A</i>	<i>Solvent B</i>	<i>T(K)</i>	$D_{AB}^0 \times 10^9 (m^2/s)$
Acetic acid	Acetone	298	3.31
Benzoic acid	Acetone	298	2.62
Carbon dioxide	Amyl alcohol	298	1.91
Water	Aniline	293	0.70
Acetic acid	Benzene	298	2.09
Carbon tetrachloride	Benzene	298	1.92
Cinnamic acid	Benzene	298	1.12
Ethanol	Benzene	280.6	1.77
Ethylene chloride	Benzene	288	2.25
Methanol	Benzene	298	3.82
Napthalene	Benzene	280.6	1.19
Carbon dioxide	<i>i</i> -Butanol	298	2.20
Acetone	Carbon tetrachloride	293	1.86
Benzene	Chlorobenzene	293	1.25
Acetone	Chloroform	288	2.36
Benzene	Chloroform	288	2.51
Ethanol	Chloroform	288	2.20
Carbon tetrachloride	Cyclohexane	298	1.49
Azobenzene	Ethanol	293	0.74
Camphor	Ethanol	293	0.70
Carbon dioxide	Ethanol	290	3.20
Carbon dioxide	Ethanol	298	3.42
Glycerol	Ethanol	293	0.51
Pyridine	Ethanol	293	1.10
Urea	Ethanol	285	0.54
Water	Ethanol	298	1.132
Water	Ethylene glycol	293	0.18
Water	Glycerol	293	0.0083
Carbon dioxide	Heptane	298	6.03
Carbon tetrachloride	<i>n</i> -Hexane	298	3.70
Toluene	<i>n</i> -Hexane	298	4.21
Carbon dioxide	Kerosene	298	2.50
Tin	Mercury	303	1.60
Water	<i>n</i> -Propanol	288	0.87
Water	1,2-Propylene glycol	293	0.0075
Acetic acid	Toluene	298	2.26
Acetone	Toluene	293	2.93
Benzoic acid	Toluene	293	1.74
Chlorobenzene	Toluene	293	2.06
Ethanol	Toluene	288	3.00
Carbon dioxide	White spirit	298	2.11

TABLE 6.5-1. Diffusivities and Permeabilities in Solids

Solute (A)	Solid (B)	T (K)	D_{AB} , Diffusion Coefficient [m^2/s]	Solubility, S [$\frac{m^3 \text{ solute(STP)}}{m^3 \text{ solid} \cdot \text{atm}}$]	Permeability, P_M [$\frac{m^3 \text{ solute(STP)}}{s \cdot m^2 \cdot \text{atm/m}}$]
H ₂	Vulcanized rubber	298	0.85(10 ⁻⁹)	0.040	0.342(10 ⁻¹⁰)
O ₂		298	0.21(10 ⁻⁹)	0.070	0.152(10 ⁻¹⁰)
N ₂		298	0.15(10 ⁻⁹)	0.035	0.054(10 ⁻¹⁰)
CO ₂		298	0.11(10 ⁻⁹)	0.90	1.01(10 ⁻¹⁰)
H ₂	Vulcanized neoprene	290	0.103(10 ⁻⁹)	0.051	
		300	0.180(10 ⁻⁹)	0.053	
H ₂	Polyethylene	298			6.53(10 ⁻¹²)
O ₂		303			4.17(10 ⁻¹²)
N ₂		303			1.52(10 ⁻¹²)
O ₂	Nylon	303			0.029(10 ⁻¹²)
N ₂		303			0.0152(10 ⁻¹²)
Air	English leather	298			0.15–0.68 × 10 ⁻⁴
H ₂ O	Wax	306			0.16(10 ⁻¹⁰)
H ₂ O	Cellophane	311			0.91–1.82(10 ⁻¹⁰)
He	Pyrex glass	293			4.86(10 ⁻¹⁵)
		373			20.1(10 ⁻¹⁵)
He	SiO ₂	293	2.4–5.5(10 ⁻¹⁴)	0.01	
H ₂	Fe	293	2.59(10 ⁻¹³)		
Al	Cu	293	1.3(10 ⁻³⁴)		