

ELECTRICAL CONDUCTIVITY OF WATER

This table gives the electrical conductivity of highly purified water over a range of temperature and pressure. The first column of conductivity data refers to water at its own vapor pressure. Equations for calculating the conductivity at any temperature and pressure may be found in the reference.

Conductivity in $\mu\text{S}/\text{cm}$ at the indicated pressure

$t/^\circ\text{C}$	Sat. vapor	50 MPa	100 MPa	200 MPa	400 MPa	600 MPa
0	0.0115	0.0150	0.0189	0.0275	0.0458	0.0667
25	0.0550	0.0686	0.0836	0.117	0.194	0.291
100	0.765	0.942	1.13	1.53	2.45	3.51
200	2.99	4.08	5.22	7.65	13.1	19.5
300	2.41	4.87	7.80	14.1	28.9	46.5
400		1.17	4.91	14.3	39.2	71.3
600			0.134	4.65	33.8	85.7

IONIC CONDUCTIVITY AND DIFFUSION AT INFINITE DILUTION

This table gives the molar (equivalent) conductivity λ for common ions at infinite dilution. All values refer to aqueous solutions at 25°C.

Ion	λ $10^{-4} \text{ m}^2 \text{ S mol}^{-1}$	D $10^{-5} \text{ cm}^2 \text{ s}^{-1}$	Ion	λ $10^{-4} \text{ m}^2 \text{ S mol}^{-1}$	D $10^{-5} \text{ cm}^2 \text{ s}^{-1}$
Inorganic Cations			Organic Cations		
Ag^+	61.9	1.648	Dipropylammonium ⁺	30.1	0.802
$1/3\text{Al}^{3+}$	61	0.541	Dodecylammonium ⁺	23.8	0.634
$1/2\text{Ba}^{2+}$	63.6	0.847	Dodecyltrimethylammonium ⁺	22.6	0.602
Cs^+	77.2	2.056	Ethanolammonium ⁺	42.2	1.124
$1/2\text{Cu}^{2+}$	53.6	0.714	Ethylammonium ⁺	47.2	1.257
$1/2\text{Cd}^{2+}$	54	0.719	Ethyltrimethylammonium ⁺	40.5	1.078
$1/2\text{Fe}^{2+}$	54	0.719	Hexadecyltrimethylammonium ⁺	20.9	0.557
$1/3\text{Fe}^{3+}$	68	0.604	Methylammonium ⁺	58.7	1.563
H^+	349.65	9.311	Pentylammonium ⁺	37	0.985
$1/2\text{Hg}^{2+}$	68.6	0.913	Piperidinium ⁺	37.2	0.991
K^+	73.48	1.957	Propylammonium ⁺	40.8	1.086
$1/3\text{La}^{3+}$	69.7	0.619	Pyridylammonium ⁺	24.3	0.647
Li^+	38.66	1.029	Tetraethylammonium ⁺	32.6	0.868
$1/2\text{Mg}^{2+}$	53.0	0.706	Tetramethylammonium ⁺	44.9	1.196
NH_4^+	73.5	1.957	Triethylsulfonium ⁺	36.1	0.961
N_2H_5^+	59	1.571	Trimethylammonium ⁺	47.23	1.258
Na^+	50.08	1.334	Organic Anions		
Rb^+	77.8	2.072	Acetate ⁻	40.9	—
$1/2\text{Sr}^{2+}$	59.4	0.791	$1/2\text{Azelate}^{2-}$	40.6	0.541
Tl^+	74.7	1.989	Benzoate ⁻	32.4	0.863
Inorganic Anions			Bromoacetate ⁻	39.2	1.044
Br^-	78.1	2.080	Bromobenzoate ⁻	30	0.799
Br_3^-	43	1.145	Butyrate ⁻	32.6	—
BrO_3^-	55.7	1.483	Chloroacetate ⁻	39.8	1.060
CN^-	78	2.077	$1/3\text{Citrate}^{3-}$	70.2	0.623
$1/2\text{CO}_3^{2-}$	69.3	0.923	Crotonate ⁻	33.2	0.884
Cl^-	76.31	2.032	Cyanoacetate ⁻	43.4	1.156
ClO_2^-	52	1.385	Dodecylsulfate ⁻	24	0.639
ClO_3^-	64.6	1.720	Formate ⁻	54.6	1.454
ClO_4^-	67.3	1.792	$1/2\text{Fumarate}^{2-}$	61.8	0.823
$1/3[\text{Co}(\text{CN})_6]^{3-}$	98.9	0.878	$1/2\text{Glutarate}^{2-}$	52.6	0.700
$1/2\text{CrO}_4^{2-}$	85	1.132	Hydrogenoxalate ⁻	40.2	1.070
F^-	55.4	1.475	Isovalerate ⁻	32.7	0.871
$1/4[\text{Fe}(\text{CN})_6]^{4-}$	110.4	0.735	Lactate ⁻	38.8	1.033
$1/3[\text{Fe}(\text{CN})_6]^{3-}$	100.9	0.896	$1/2\text{Malate}^{2-}$	58.8	0.783
HS^-	65	1.731	Methylsulfate ⁻	48.8	1.299
I^-	76.8	2.045	Picrate ⁻	30.37	0.809
IO_3^-	40.5	1.078	Pivalate ⁻	31.9	0.849
IO_4^-	54.5	1.451	Propionate ⁻	35.8	0.953
MnO_4^-	61.3	1.632	Propylsulfate ⁻	37.1	0.988
NO_3^-	—	1.902	Salicylate ⁻	—	0.959
OH^-	198	5.273	$1/2\text{Succinate}^{2-}$	58.8	0.783
SCN^-	66	1.758	<i>p</i> -Sulfonate ⁻	29.3	0.780
$1/2\text{SO}_3^{2-}$	72	0.959	$1/2\text{Tartarate}^{2-}$	59.6	0.794
$1/2\text{SO}_4^{2-}$	80.0	1.065	Trichloroacetate ⁻	35	0.932
$1/2\text{WO}_4^{2-}$	69	0.919			