calculatoratoz.com

unitsconverters.com

Important Formulas of Conductance

Calculators! Examples! Conversions!

List of 17 Important Formulas of Conductance

Important Formulas of Conductance

1) Charge Number of Ion Species using Debey-Huckel Limiting Law

Open Calculator

fx $$Z_i = \left(-\frac{\ln(\gamma_{\pm})}{A \cdot \sqrt{I}}\right)^{\frac{1}{2}}$$

ex $$2.941016 = \left(-\frac{\ln(0.05)}{0.509\text{kg\^{}}(1/2)/\text{mol\^{}}(1/2) \cdot \sqrt{0.463\text{mol/kg}}}\right)^{\frac{1}{2}}$$

2) Conductance

Open Calculator

fx $$G = \frac{1}{R}$$

ex $$9900.99℧ = \frac{1}{0.000101\Omega}$$

3) Conductivity given Cell Constant

Open Calculator

fx $$K = (G \cdot b)$$

ex $$4960.025\text{S/m} = (9900.25℧ \cdot 0.501/\text{m})$$

4) Conductivity given Conductance

Open Calculator

fx $$K = (G) \cdot \left(\frac{l}{a}\right)$$

ex $$4714.405\text{S/m} = (9900.25\mho) \cdot \left(\frac{5\text{m}}{10.5\text{m}^2}\right)$$

5) Conductivity given Molar Volume of Solution

Open Calculator

fx $$K = \left(\frac{\Lambda_{m(\text{solution})}}{V_m}\right)$$

ex $$4464.286\text{S/m} = \left(\frac{100\text{S*m}^2/\text{mol}}{0.0224\text{m}^3/\text{mol}}\right)$$

6) Debey-Huckel Limiting Law Constant

Open Calculator

fx $$A = -\frac{\ln(\gamma_\pm)}{Z_i^2} \cdot \sqrt{I}$$

ex $$0.509605\text{kg}^{\wedge}(1/2)/\text{mol}^{\wedge}(1/2) = -\frac{\ln(0.05)}{(2)^2} \cdot \sqrt{0.463\text{mol/kg}}$$

7) Degree of Dissociation

Open Calculator

fx $$\alpha = \frac{\Lambda_{m}}{\Lambda^{\circ}_{m}}$$

ex $$0.352941 = \frac{150\text{S*m}^2/\text{mol}}{425\text{S*m}^2/\text{mol}}$$

8) Degree of Dissociation given Concentration and Dissociation Constant of Weak Electrolyte

Open Calculator

fx $$\alpha = \sqrt{\frac{K_{a}}{C}}$$

ex $$0.350823 = \sqrt{\frac{1.6\text{E\^{}-4}}{0.0013\text{mol/L}}}$$

9) Dissociation Constant given Degree of Dissociation of Weak Electrolyte

Open Calculator

fx $$K_{a} = C \cdot \left((\alpha)^{2} \right)$$

ex $$0.000159 = 0.0013\text{mol/L} \cdot \left((0.35)^{2} \right)$$

10) Dissociation Constant of Acid 1 given Degree of Dissociation of Both Acids

Open Calculator

$$K_{a1} = (K_{a2}) \cdot \left(\left(\frac{\alpha_1}{\alpha_2}\right)^2\right)$$

$$0.000238 = (1.1E\hat{}\text{-}4) \cdot \left(\left(\frac{0.5}{0.34}\right)^2\right)$$

11) Dissociation Constant of Base 1 given Degree of Dissociation of Both Bases

Open Calculator

$$K_{b1} = (K_{b2}) \cdot \left(\left(\frac{\alpha_1}{\alpha_2}\right)^2\right)$$

$$0.001081 = (0.0005) \cdot \left(\left(\frac{0.5}{0.34}\right)^2\right)$$

12) Distance between Electrode given Conductance and Conductivity

Open Calculator

$$l = \frac{K \cdot a}{G}$$

$$5.196838\text{m} = \frac{4900\text{S/m} \cdot 10.5\text{m}^2}{9900.25℧}$$

13) Equilibrium Constant given Degree of Dissociation

Open Calculator

fx $$k_C = C_0 \cdot \frac{\alpha^2}{1-\alpha}$$

ex $$0.056538\text{mol/L} = 0.3\text{mol/L} \cdot \frac{(0.35)^2}{1-0.35}$$

14) Equivalent Conductance

Open Calculator

fx $$E = K \cdot V$$

ex $$784℧ = 4900\text{S/m} \cdot 160\text{L}$$

15) Molar Conductance

Open Calculator

fx $$\lambda = \frac{K}{M}$$

ex $$0.088288℧ = \frac{4900\text{S/m}}{55.5\text{mol/L}}$$

16) Molar Conductivity at Infinite Dilution

Open Calculator

fx $$\Lambda_{AB} = (u_A + u_B) \cdot [\text{Faraday}]$$

ex $$21226.77\text{S/m} = (0.1\text{m}^2/\text{V*s} + 0.12\text{m}^2/\text{V*s}) \cdot [\text{Faraday}]$$

17) Specific Conductance

Open Calculator

fx $$K = \frac{1}{\rho}$$

ex $$4545.455 \mathrm{S/m} = \frac{1}{0.00022 \Omega^{*} \mathrm{m}}$$

Variables Used

- **a** Electrode Cross-sectional Area *(Square Meter)*
- **A** Debye Huckel limiting Law Constant *(sqrt(Kilogram) per sqrt(Mole))*
- **b** Cell Constant *(1 per Meter)*
- **C** Ionic Concentration *(Mole per Liter)*
- C_0 Initial Concentration *(Mole per Liter)*
- **E** Equivalent Conductance *(Mho)*
- **G** Conductance *(Mho)*
- **I** Ionic Strength *(Mole per Kilogram)*
- **K** Specific Conductance *(Siemens per Meter)*
- K_a Dissociation Constant of Weak Acid
- K_{a1} Dissociation Constant of Acid 1
- K_{a2} Dissociation Constant of Acid 2
- K_{b1} Dissociation Constant of Base 1
- K_{b2} Dissociation Constant of Base 2
- k_C Equilibrium Constant *(Mole per Liter)*
- **l** Distance between Electrodes *(Meter)*
- **M** Molarity *(Mole per Liter)*
- **R** Resistance *(Ohm)*
- u_A Mobility of Cation *(Square Meter per Volt per Second)*
- u_B Mobility of Anion *(Square Meter per Volt per Second)*
- **V** Volume of Solution *(Liter)*
- V_m Molar Volume *(Cubic Meter per Mole)*

- Z_i Charge Number of Ion Species
- $\gamma_{\pm}$ Mean Activity Coefficient
- λ Molar Conductance *(Mho)*
- Λ_{AB} Molar Conductivity at Infinite Dilution *(Siemens per Meter)*
- Λ_m Molar Conductivity *(Siemens Square Meter per Mole)*
- $\Lambda_{m(solution)}$ Solution Molar Conductivity *(Siemens Square Meter per Mole)*
- $\Lambda°_m$ Limiting Molar Conductivity *(Siemens Square Meter per Mole)*
- ρ Resistivity *(Ohm Meter)*
- α Degree of Dissociation
- α_1 Degree of Dissociation 1
- α_2 Degree of Dissociation 2

Constants, Functions, Measurements used

- Constant: **[Faraday]**, 96485.33212 Coulomb / Mole
  Faraday constant
- Function: **ln**, ln(Number)
  Natural logarithm function (base e)
- Function: **sqrt**, sqrt(Number)
  Square root function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Volume** in Liter (L)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion
- Measurement: **Electric Resistance** in Ohm (Ω)
  Electric Resistance Unit Conversion
- Measurement: **Electric Conductance** in Mho (℧)
  Electric Conductance Unit Conversion
- Measurement: **Electric Resistivity** in Ohm Meter (Ω*m)
  Electric Resistivity Unit Conversion
- Measurement: **Electric Conductivity** in Siemens per Meter (S/m)
  Electric Conductivity Unit Conversion
- Measurement: **Molar Concentration** in Mole per Liter (mol/L)
  Molar Concentration Unit Conversion
- Measurement: **Molar Magnetic Susceptibility** in Cubic Meter per Mole (m^3/mol)
  Molar Magnetic Susceptibility Unit Conversion

- Measurement: **Molality** in Mole per Kilogram (mol/kg)
  Molality Unit Conversion
- Measurement: **Wave Number** in 1 per Meter (1/m)
  Wave Number Unit Conversion
- Measurement: **Mobility** in Square Meter per Volt per Second (m²/V*s)
  Mobility Unit Conversion
- Measurement: **Molar Conductivity** in Siemens Square Meter per Mole (S*m²/mol)
  Molar Conductivity Unit Conversion
- Measurement: **Debye–Hückel limiting law constant** in sqrt(Kilogram) per sqrt(Mole) (kg^(1/2)/mol^(1/2))
  Debye–Hückel limiting law constant Unit Conversion

Check other formula lists

- Activity of Electrolytes Formulas
- Concentration of Electrolyte Formulas
- Conductance and Conductivity Formulas
- Debey Huckel Limiting Law Formulas
- Degree of Dissociation Formulas
- Dissociation Constant Formulas
- Electrochemical Cell Formulas
- Electrolytes & Ions Formulas
- EMF of Concentration Cell Formulas
- Equivalent Weight Formulas
- Gibbs Free Energy Formulas
- Gibbs Free Entropy Formulas
- Helmholtz Free Energy Formulas
- Helmholtz Free Entropy Formulas
- Important Formulas of Activity and Concentration of Electrolytes
- Important Formulas of Conductance
- Important Formulas of Current Efficiency and Resistance
- Important Formulas of Gibbs Free Energy and Entropy and Helmholtz Free Energy and Entropy
- Important Formulas of Ionic Activity
- Ionic Strength Formulas
- Mean Activity Coefficient Formulas
- Mean Ionic Activity Formulas
- Normality of Solution Formulas
- Osmotic Coefficient & Current Efficiency Formulas
- Resistance and Resistivity Formulas
- Tafel Slope Formulas
- Temperature of Concentration Cell Formulas
- Transport Number Formulas

Feel free to SHARE this document with your friends!

PDF Available in

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

11/29/2023 | 5:42:18 AM UTC *Please leave your feedback here...*