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Important Formulas of Basic Chemistry

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List of 9 Important Formulas of Basic Chemistry

Important Formulas of Basic Chemistry

1) Boiling Point

$$\text{fx } bp = bp_{\text{solvent}} \cdot \Delta bp$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 961.2\text{K} = 80.1\text{K} \cdot 12\text{K}$$

2) Bond Order

$$\text{fx } \text{B.O} = \left(\frac{1}{2}\right) \cdot (\text{B } e^- - \text{A.B } e^-)$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 2 = \left(\frac{1}{2}\right) \cdot (8 - 4)$$

3) Change in Boiling Point of Solvent

$$\text{fx } \Delta bp = K_b \cdot m$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 12\text{K} = 4.8 \cdot 2.5\text{mol/L}$$



4) Molar Volume 

$$fx \quad v_m = \frac{A \cdot M_{\text{molar}}}{\rho}$$

Open Calculator 

$$ex \quad 1.2E^{-6} \text{m}^3/\text{mol} = \frac{28.085\text{g} \cdot 44.01\text{g}/\text{mol}}{997\text{kg}/\text{m}^3}$$

5) Mole Fraction 

$$fx \quad X = \frac{n}{n + N}$$

Open Calculator 

$$ex \quad 0.398726 = \frac{3.4483\text{mol}}{3.4483\text{mol} + 5.2\text{mol}}$$

6) Molecular Formula 

$$fx \quad M.F = \frac{M_{\text{molar}}}{EFM}$$

Open Calculator 

$$ex \quad 2442.286 = \frac{44.01\text{g}/\text{mol}}{0.01802\text{g}}$$

7) Partition Coefficient 

$$fx \quad K = \frac{CS}{cm}$$

Open Calculator 

$$ex \quad 1.0875 = \frac{0.087\text{mol}/\text{L}}{0.080\text{mol}/\text{L}}$$



8) Percent by Weight

$$\text{fx } \% \text{ by wt.} = \frac{\text{gSolute}}{100\text{gSolution}}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$\text{ex } 0.2 = \frac{20\text{g}}{100\text{g}}$$

9) Specific Heat Capacity

$$\text{fx } c = \frac{Q}{M \cdot \Delta T_{\text{rise}}}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$\text{ex } 7.404795\text{kJ/kg}\cdot\text{K} = \frac{4200\text{J}}{35.45\text{g} \cdot 16\text{K}}$$



Variables Used










- **% by wt.** Percent By Weight
- **100gSolution** 100 g of Solution (*Gram*)
- **A** Atomic Weight (*Gram*)
- **A.B e⁻** Number of Antibonding Electrons
- **B e⁻** Number of Bonding Electrons
- **B.O** Bond Order
- **bp** Boiling Point (*Kelvin*)
- **bp_{solvent}** Boiling Point of Solvent (*Kelvin*)
- **c** Specific Heat Capacity (*Kilojoule per Kilogram per K*)
- **cm** Concentration of Solute in Mobile Phase (*Mole per Liter*)
- **cs** Concentration of Solute in Stationary Phase (*Mole per Liter*)
- **EFM** Mass of Empirical Formulas (*Gram*)
- **gSolute** Gram of Solute (*Gram*)
- **K** Partition Coefficient
- **K_b** Molal Boiling Point Elevation Constant
- **m** Molal Concentration of Solute (*Mole per Liter*)
- **M** Mass (*Gram*)
- **M_{molar}** Molar Mass (*Gram Per Mole*)
- **M.F** Molecular Formula
- **n** Number of Moles of Solute (*Mole*)
- **N** Number of Moles of Solvent (*Mole*)
- **Q** Heat Energy (*Joule*)
- **V_m** Molar Volume (*Cubic Meter per Mole*)



- **X** Mole Fraction
- **Δb_p** Change in Boiling Point of Solvent (Kelvin)
- **ΔT_{rise}** Rise in Temperature (Kelvin)
- **ρ** Density (Kilogram per Cubic Meter)



Constants, Functions, Measurements used

- **Measurement: Weight** in Gram (g)
Weight Unit Conversion 
- **Measurement: Temperature** in Kelvin (K)
Temperature Unit Conversion 
- **Measurement: Amount of Substance** in Mole (mol)
Amount of Substance Unit Conversion 
- **Measurement: Energy** in Joule (J)
Energy Unit Conversion 
- **Measurement: Specific Heat Capacity** in Kilojoule per Kilogram per K (kJ/kg*K)
Specific Heat Capacity Unit Conversion 
- **Measurement: Molar Concentration** in Mole per Liter (mol/L)
Molar Concentration Unit Conversion 
- **Measurement: Density** in Kilogram per Cubic Meter (kg/m³)
Density Unit Conversion 
- **Measurement: Molar Mass** in Gram Per Mole (g/mol)
Molar Mass Unit Conversion 
- **Measurement: Molar Magnetic Susceptibility** in Cubic Meter per Mole (m³/mol)
Molar Magnetic Susceptibility Unit Conversion 



Check other formula lists

- [Determination of Equivalent Mass Formulas](#) 
- [Important Formulas of Basic Chemistry](#) 

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