Important Formulas of Basic Chemistry PDF

Formulas
Examples
with Units

List of 9
Important Formulas of Basic Chemistry

1) Boiling Point Formula

Evaluate Formula

Formula	Example with Units
$bp = bp_{solvent} \cdot \Delta bp$	$961.2\,\text{K} = 80.1\,\text{K} \cdot 12\,\text{K}$

2) Bond Order Formula

Evaluate Formula

Formula	Example
$B.O = \left(\frac{1}{2}\right) \cdot \left(B\,e^{-} - A.B\,e^{-}\right)$	$2 = \left(\frac{1}{2}\right) \cdot \left(8 - 4\right)$

3) Change in Boiling Point of Solvent Formula

Evaluate Formula

Formula	Example with Units
$\Delta bp = K_b \cdot m$	$12\,\text{K} = 4.8 \cdot 2.5\,\text{mol/L}$

4) Molar Volume Formula

Evaluate Formula

Formula	Example with Units
$v_m = \frac{A \cdot M_{molar}}{\rho}$	$1.2\text{E-}6\,\text{m}^3\text{/mol} = \frac{28.085\,\text{g} \cdot 44.01\,\text{g/mol}}{997\,\text{kg/m}^3}$

5) Mole Fraction Formula

Evaluate Formula

Formula	Example with Units
$X = \frac{n}{n + N}$	$0.3987 = \frac{3.4483\,\text{mol}}{3.4483\,\text{mol} + 5.2\,\text{mol}}$

6) Molecular Formula Formula

Evaluate Formula

Formula	Example with Units
$M.F = \frac{M_{molar}}{EFM}$	$2442.2863 = \frac{44.01\,\text{g/mol}}{0.01802\,\text{g}}$

7) Partition Coefficient Formula

Evaluate Formula

Formula

$$K = \frac{cs}{cm}$$

Example with Units

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

8) Percent by Weight Formula

Evaluate Formula

Formula

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

Example with Units

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

9) Specific Heat Capacity Formula

Evaluate Formula

Formula

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

Example with Units

$$7.4048\,\text{kJ/kg*K} = \frac{4200\,\text{J}}{35.45\,\text{g} \cdot 16\,\text{K}}$$

Variables used in list of Important Formulas of Basic Chemistry above

- **% 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
- **Δbp** Change in Boiling Point of Solvent *(Kelvin)*
- **ΔT_{rise}** Rise in Temperature *(Kelvin)*
- **ρ** Density *(Kilogram per Cubic Meter)*

Constants, Functions, Measurements used in list of Important Formulas of Basic Chemistry above

- 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/m^3)
  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 (m^3/mol)
  Molar Magnetic Susceptibility Unit Conversion

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