Molarity, mg/L, meq/L and as-$CaCO_3$ Converter

Convert a solute concentration between mol/L, mmol/L, mg/L, milliequivalents per litre and mg/L as $CaCO_3$ from its molar mass and charge (valence).

Method: Mole; equivalent and $CaCO_3$ equivalence (equivalent weight 50.04)

Input parameters

Unit system: SI

Parameter	Value	Unit
Concentration (choose its unit)	1.0000	mmol/L
Molar mass	0.040080	g/mol
Charge or valence (equivalents per mole)	2.0000	

Calculated results

Parameter	Value	Unit
mol/L	0.001000	mol/L
mmol/L	1.0000	mmol/L
mg/L	40.080	mg/L
meq/L	2.0000	
mg/L as $CaCO_3$	100.09	mg/L

Notes for this case

• Mass concentration is molarity times molar mass (1 mmol/L of Ca^{2+}, 40.08 g/mol, is 40.08 mg/L). Equivalents count charge: multiply by the valence, so 1 mmol/L of Ca^{2+} is 2 meq/L. Water analyses express hardness and alkalinity as $CaCO_3$, whose equivalent weight is 50.04 mg/meq, so 2 meq/L is 100 mg/L as $CaCO_3$. Use the molar mass of the ion as it is reported (HCO_3^- 61.02, SO_4^{2-} 96.06, Cl^- 35.45).

Formula and method

$$\rho = cM, \quad c_{eq} = zc, \quad c_{CaCO_3} = 50.04\, c_{eq}$$

Variables

c	Concentration (choose its unit)	mol/m³
M	Molar mass	kg/kmol
z	Charge or valence (equivalents per mole)	-
ρ	mg/L	kg/m³
c_{eq}	meq/L	-
c_{CaCO_3}	mg/L as $CaCO_3$	kg/m³

Method and standards

Molarity.

Assumptions and limits

- Complete dissociation.

References

Mole, equivalent and $CaCO_3$ equivalence (equivalent weight 50.04)

Report details

Report reference	FCC-9ZW9-FE9E (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/unit-conversions/molarity-mg-l-meq-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.