

Chemical formulas of 100 common compounds: names, formulas, molar masses and everyday names

[] A capital letter (plus a lowercase one) is an element: CO is carbon and oxygen, Co is cobalt. A subscript counts atoms; after a bracket it multiplies everything inside: $\text{Ca}(\text{OH})_2 = 1 \text{ Ca}, 2 \text{ O}, 2 \text{ H}$. A dot joins water of crystallisation; a coefficient counts molecules ($3 \text{ H}_2\text{O} = 6 \text{ H}, 3 \text{ O}$)

[] Molar mass = the sum of the atomic masses, g/mol; moles = mass / molar mass. Atomic masses used: H 1.008, C 12.01, N 14.01, O 16.00, Na 22.99, Mg 24.31, Al 26.98, Si 28.09, P 30.97, S 32.06, Cl 35.45, K 39.10, Ca 40.08, Fe 55.85, Cu 63.55, Zn 65.38, Br 79.90, Ag 107.87, I 126.90, Li 6.94, Mn 54.94, Ba 137.33, Ti 47.87

Name	Formula	g/mol	Everyday name or use
GASES AND SMALL MOLECULES			
water	H_2O	18.02	
hydrogen peroxide	H_2O_2	34.01	antiseptic (3%)
carbon dioxide	CO_2	44.01	dry ice; fizz
carbon monoxide	CO	28.01	poisonous
oxygen	O_2	32.00	
ozone	O_3	48.00	ozone layer
nitrogen	N_2	28.01	78% of air
hydrogen	H_2	2.016	
chlorine	Cl_2	70.90	
ammonia	NH_3	17.03	household ammonia
nitrous oxide	N_2O	44.01	laughing gas
nitrogen dioxide	NO_2	46.01	brown smog gas
sulfur dioxide	SO_2	64.07	acid rain
hydrogen sulfide	H_2S	34.08	rotten-egg gas
hydrogen chloride	HCl	36.46	
methane	CH_4	16.04	natural gas
ethane	C_2H_6	30.07	
propane	C_3H_8	44.10	bottled gas
butane	C_4H_{10}	58.12	lighter fuel
ethene	C_2H_4	28.05	ripens fruit
ethyne	C_2H_2	26.04	welding
ORGANIC COMPOUNDS			
methanol	CH_3OH	32.04	wood alcohol
ethanol	$\text{C}_2\text{H}_5\text{OH}$	46.07	drinks; sanitiser
propan-2-ol	$(\text{CH}_3)_2\text{CHOH}$	60.10	rubbing alcohol
acetone (propanone)	CH_3COCH_3	58.08	nail-polish remover
methanal	HCHO	30.03	formalin
ethanal	CH_3CHO	44.05	
methanoic (formic) acid	HCOOH	46.03	ant stings
ethanoic (acetic) acid	CH_3COOH	60.05	vinegar
propanoic acid	$\text{C}_2\text{H}_5\text{COOH}$	74.08	bread preservative
butanoic (butyric) acid	$\text{C}_3\text{H}_7\text{COOH}$	88.11	rancid butter
benzene	C_6H_6	78.11	
phenol	$\text{C}_6\text{H}_5\text{OH}$	94.11	carbolic acid
benzoic acid	$\text{C}_6\text{H}_5\text{COOH}$	122.12	
sodium benzoate	$\text{C}_6\text{H}_5\text{COONa}$	144.10	preservative E211
octane	C_8H_{18}	114.23	petrol
glucose	$\text{C}_6\text{H}_{12}\text{O}_6$	180.16	blood sugar
sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	342.30	table sugar
lactic acid	$\text{C}_3\text{H}_6\text{O}_3$	90.08	sour milk
citric acid	$\text{C}_6\text{H}_8\text{O}_7$	192.12	lemons
urea	$\text{CO}(\text{NH}_2)_2$	60.06	fertiliser
aspirin	$\text{C}_9\text{H}_8\text{O}_4$	180.16	
caffeine	$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$	194.19	
chloroform	CHCl_3	119.37	
tetrachloromethane	CCl_4	153.81	

Acids, bases, salts and oxides

Name	Formula	g/mol	Everyday name or use
ACIDS			
hydrochloric acid	HCl	36.46	strong; stomach acid
hydrobromic acid	HBr	80.91	strong
hydroiodic acid	HI	127.91	strong
nitric acid	HNO ₃	63.01	strong
sulfuric acid	H ₂ SO ₄	98.08	strong; battery acid
perchloric acid	HClO ₄	100.46	strong, the strongest
chloric acid	HClO ₃	84.46	strong
phosphoric acid	H ₃ PO ₄	97.99	weak; cola
carbonic acid	H ₂ CO ₃	62.03	weak; fizzy water
hydrofluoric acid	HF	20.01	weak; etches glass
hydrocyanic acid	HCN	27.03	weak; deadly
boric acid	H ₃ BO ₃	61.83	weak; eyewash
oxalic acid	H ₂ C ₂ O ₄	90.03	weak; rhubarb
BASES			
sodium hydroxide	NaOH	40.00	caustic soda, lye
potassium hydroxide	KOH	56.11	caustic potash
lithium hydroxide	LiOH	23.95	CO ₂ scrubber
calcium hydroxide	Ca(OH) ₂	74.09	slaked lime
magnesium hydroxide	Mg(OH) ₂	58.32	milk of magnesia
barium hydroxide	Ba(OH) ₂	171.34	
ammonia solution	NH ₄ OH	35.05	household ammonia
sodium bicarbonate	NaHCO ₃	84.01	baking soda
sodium carbonate	Na ₂ CO ₃	105.99	washing soda
SALTS			
sodium chloride	NaCl	58.44	table salt
potassium chloride	KCl	74.55	low-sodium salt
lithium bromide	LiBr	86.85	chillers; desiccant
calcium carbonate	CaCO ₃	100.09	chalk, limestone, marble
calcium sulfate dihydrate	CaSO ₄ ·2H ₂ O	172.17	gypsum
calcium chloride	CaCl ₂	110.98	de-icer
magnesium sulfate heptahydrate	MgSO ₄ ·7H ₂ O	246.47	Epsom salt
copper(II) sulfate pentahydrate	CuSO ₄ ·5H ₂ O	249.69	blue vitriol
ammonium nitrate	NH ₄ NO ₃	80.04	fertiliser
ammonium chloride	NH ₄ Cl	53.49	sal ammoniac
potassium nitrate	KNO ₃	101.10	saltpetre
sodium nitrate	NaNO ₃	84.99	Chile saltpetre
iron(II) sulfate heptahydrate	FeSO ₄ ·7H ₂ O	278.01	green vitriol; iron tablets
silver nitrate	AgNO ₃	169.87	chloride test
potassium permanganate	KMnO ₄	158.03	purple oxidiser
sodium hypochlorite	NaOCl	74.44	bleach
sodium fluoride	NaF	41.99	toothpaste
potassium iodide	KI	166.00	iodised salt
calcium phosphate	Ca ₃ (PO ₄) ₂	310.18	bone mineral
OXIDES AND MINERALS			
iron(III) oxide	Fe ₂ O ₃	159.69	rust
silicon dioxide	SiO ₂	60.08	sand, quartz
aluminium oxide	Al ₂ O ₃	101.96	alumina; ruby
calcium oxide	CaO	56.08	quicklime
magnesium oxide	MgO	40.30	magnesia
zinc oxide	ZnO	81.38	sunscreen
titanium dioxide	TiO ₂	79.87	white pigment
copper(II) oxide	CuO	79.55	
manganese dioxide	MnO ₂	86.94	batteries

Worked molar masses: HClO₄ = 1.008 + 35.45 + 64.00 = 100.46; MgSO₄·7H₂O = 24.31 + 32.06 + 64.00 + 126.14 = 246.47; C₆H₅COONa (C₇H₅O₂Na) = 84.07 + 5.04 + 32.00 + 22.99 = 144.10. 29 g of acetone = 29 / 58.08 = 0.50 mol.

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