

Topic 7 – Chemical Formulae of Compounds

What is a chemical formula?

Chemical formula: a symbolic representation that shows composition in an element or a compound
 → used to explain chemical reactions through chemical equations

Chemical formulae of some common ions

Positive ions (cations)

Charge	Ion	Chemical formula
+1	hydrogen lithium sodium potassium ammonium*	H ⁺ Li ⁺ Na ⁺ K ⁺ NH ₄ ⁺
+2	magnesium calcium copper(II) iron(II) lead(II) zinc	Mg ²⁺ Ca ²⁺ Cu ²⁺ Fe ²⁺ Pb ²⁺ Zn ²⁺
+3	aluminium iron(III)	Al ³⁺ Fe ³⁺
+4	lead(IV)	Pb ⁴⁺

Negative ions (anions)

Charge	Ion	Chemical formula
-1	fluoride chloride bromide iodide hydroxide* nitrate* ethanoate* hydrogen carbonate*	F ⁻ Cl ⁻ Br ⁻ I ⁻ OH ⁻ NO ₃ ⁻ CH ₃ COO ⁻ HCO ₃ ⁻
-2	oxide sulfide carbonate* sulfite* sulfate*	O ²⁻ S ²⁻ CO ₃ ²⁻ SO ₃ ²⁻ SO ₄ ²⁻
-3	nitride phosphate*	N ³⁻ PO ₄ ³⁻

* denotes polyatomic ions (ions made up of a group of atoms bonded covalently)

* write the charge of transition metals

Formulae of some common compounds

Compound name	Chemical formula
ammonia	NH_3
carbon dioxide	CO_2
carbon monoxide	CO
methane	CH_4
sulfur dioxide	SO_2
hydrogen chloride / hydrochloric acid	HCl
sulfuric acid	H_2SO_4
nitric acid	HNO_3
ethanoic acid	CH_3COOH
hydrogen peroxide	H_2O_2

Practice questions

S/N	Compound	Name / chemical formula
1	BCl_3	
2	carbon disulfide	
3	CCl_4	
4	xenon tetroxide	
5	Cl_2	
6	carbon tetraiodide	
7	dichlorine monoxide	
8	PF_3	
9	dinitrogen monoxide	
10	N_2O_3	
11	dinitrogen tetrahydride	
12	silicon dioxide	
13	diiodine pentoxide	
14	N_2O_5	
15	oxygen difluoride	
16	phosphorus pentachloride	
17	bromine gas	
18	trisilicon tetranitride	
19	I_4O_9	
20	O_3	
21	Cl_2O_8	
22	xenon dioxide	
23	Si_2H_3	
24	carbon tetrabromide	

25	S_4N_4	
26	CO	
27	CO_2	
28	xenon trioxide	
29	iodine gas	
30	diantimony trioxide	
31	ammonia gas	
32	SF_4	
33	BiCl_3	
34	NO_2	
35	PCl_3	
36	P_4Se_3	
37	carbon monofluoride	
38	disulfur decafluoride	
39	sulfur trioxide	
40	silicon carbide	
41	phosphorus pentoxide	
42	O_2	
43	sulfur hexafluoride	
44	CF_4	
45	PI_3	
46	N_2O_4	
47	dicarbon monoxide	
48	phosphorus pentaiodide	
49	phosphorus tribromide	
50	As_2O_5	

51	SO ₂	
52	Cl ₂ O ₇	
53	nitrogen monoxide	
54	SCl ₂	
55	N ₂	
56	XeF ₆	
57	carbon trioxide	
58	H ₂ O ₂	
59	P ₂ O ₃	
60	phosphorus pentafluoride	
61	disulfur dichloride	
62	NF ₃	
63	phosphorus pentabromide	
64	F ₂	
65	tetrarsenic hexoxide	
66	P ₄ S ₁₀	
67	SiCl ₄	
68	antimony pentachloride	
69	hydrogen gas	
70	H ₂	