

POLYVALENT BINARY IONIC COMPOUNDS

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Polyvalent: Atom that can have more than one charge

Binary: Contain 2 elements

Ionic: Metal + Nonmetal

Compounds: Have more than one type of atom

POLYVALENT BINARY IONIC COMPOUNDS

1	1A																	18	8A					
1	H Hydrogen 1.01																	He Helium 4.00						
2	Li Lithium 6.94	Be Beryllium 9.01																	B Boron 10.81	C Carbon 12.01	N Nitrogen 14.01	O Oxygen 16.00	F Fluorine 19.00	Ne Neon 20.18
3	Na Sodium 22.99	Mg Magnesium 24.31	3	4	5	6	7	8	9	10	11	12	Al Aluminum 26.98	Si Silicon 28.09	P Phosphorus 30.97	S Sulfur 32.07	Cl Chlorine 35.45	Ar Argon 39.95						
4	K Potassium 39.10	Ca Calcium 40.08	Sc Scandium 44.96	Ti Titanium 47.87	V Vanadium 50.94	Cr Chromium 52.00	Mn Manganese 54.94	Fe Iron 55.85	Co Cobalt 58.93	Ni Nickel 58.69	Cu Copper 63.55	Zn Zinc 65.39	Ga Gallium 69.72	Ge Germanium 72.61	As Arsenic 74.92	Se Selenium 78.96	Br Bromine 79.90	Kr Krypton 83.80						
5	Rb Rubidium 85.47	Sr Strontium 87.62	Y Yttrium 88.91	Zr Zirconium 91.22	Nb Niobium 92.91	Mo Molybdenum 95.94	Tc Technetium (98)	Ru Ruthenium 101.07	Rh Rhodium 102.91	Pd Palladium 106.42	Ag Silver 107.87	Cd Cadmium 112.41	In Indium 114.82	Sn Tin 118.71	Sb Antimony 121.76	Te Tellurium 127.60	I Iodine 126.90	Xe Xenon 131.29						
6	Cs Cesium 132.91	Ba Barium 137.33	La Lanthanum 138.91	Hf Hafnium 178.49	Ta Tantalum 180.95	W Tungsten 183.84	Re Rhenium 186.21	Os Osmium 190.23	Ir Iridium 192.22	Pt Platinum 195.08	Au Gold 196.97	Hg Mercury 200.59	Tl Thallium 204.38	Pb Lead 207.2	Bi Bismuth 208.98	Po Polonium (209)	At Astatine (210)	Rn Radon (222)						
7	Fr Francium (223)	Ra Radium (226)	Ac Actinium (227)	Rf Rutherfordium (261)	Db Dubnium (262)	Sg Seaborgium (266)	Bh Bohrium (264)	Hs Hassium (269)	Mt Meitnerium (268)															
			Ce Cerium 140.12	Pr Praseodymium 140.91	Nd Neodymium 144.24	Pm Promethium (145)	Sm Samarium 150.36	Eu Europium 151.96	Gd Gadolinium 157.25	Tb Terbium 158.93	Dy Dysprosium 162.50	Ho Holmium 164.93	Er Erbium 167.26	Tm Thulium 168.93	Yb Ytterbium 173.04	Lu Lutetium 174.97								
			Th Thorium 232.04	Pa Protactinium 231.04	U Uranium 238.03	Np Neptunium (237)	Pu Plutonium (244)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (262)								

Key

- 11 — Atomic number
- Na — Element symbol
- Sodium — Element name
- 22.99 — Average atomic mass*

* If this number is in parentheses, then it refers to the atomic mass of the most stable isotope.

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On the back
of your PT

Polyvalent Ions:

Antimony	Sb^{3+}	Sb^{5+}
Bismuth	Bi^{3+}	Bi^{5+}
Chromium	Cr^{2+}	Cr^{3+}
Cobalt	Co^{2+}	Co^{3+}
Copper	Cu^+	Cu^{2+}
Gold	Au^+	Au^{3+}
Iron	Fe^{2+}	Fe^{3+}
Lead	Pb^{2+}	Pb^{4+}
Manganese	Mn^{2+}	Mn^{4+}
Mercury	Hg^{2+}	Hg_2^{2+}
Niobium	Nb^{3+}	Nb^{5+}
Platinum	Pt^{2+}	Pt^{4+}
Tin	Sn^{2+}	Sn^{4+}
Titanium	Ti^{3+}	Ti^{4+}
Vanadium	V^{3+}	V^{5+}

POLYVALENT BINARY IONIC COMPOUNDS

Figuring out charge from formulas: $2x: Ni_3N_2$

1. Identify the charge of the nonmetal



2. Charges in a compound must add up to zero; calculate the charge of the metal.

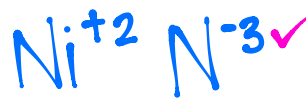
$$3(x) + 2(-3) = 0$$

$$3x + -6 = 0$$

$$3x = 6$$

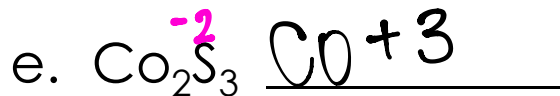
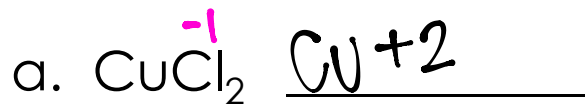
$$x = 2$$

-OR-



POLYVALENT BINARY IONIC COMPOUNDS

Figuring out charge from formulas:



POLYVALENT BINARY IONIC COMPOUNDS

Roman Numeral Review...

1. I

2. II

3. III

4. IV

5. V

6. VI

7. VII

8. VIII

9. IX

10. X

POLYVALENT BINARY IONIC COMPOUNDS

Naming Rules: everything stays the same except...

- Metal

Keep name the same, add a Roman numeral after to represent the charge

- Example: PbCl_4 Lead IV chloride

POLYVALENT BINARY IONIC COMPOUNDS



Iron III Oxide



Gold III Nitride



Manganese IV Oxide



Nickel II Chloride



Copper I Phosphide



Platinum IV Sulfide