

Worksheets

Quiz

Ionic Hydrates

IONIC HYDRATES - are ionic compounds that have one or more water molecules loosely attached.

Hydrates are named by

[a] stating the name of the ionic compound

[b] following this with hydrate to which the prefix for the number of waters has been added.

Ex. $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}_{(s)}$

Molecular Compounds

MOLECULAR THEORY - **nonmetal** atoms **share electrons** in a **covalent bond** to attain a maximum number of valence electrons (complete outer shell) rather than gaining electrons from metal atoms.

Ex. CO_2 carbon dioxide

Molecular elements - although the chemical formula of metals are frequently shown alone as a single atom (Na), nonmetals frequently form **diatomic molecules**.

Ex. H_2 , N_2 , O_2 , F_2 , Cl_2 , Br_2 , I_2



Also: O_3 , P_4 , S_8

Naming *Binary molecular compounds*

As outlined by IUPAC rules, some molecular compounds signify the number of atoms in the molecular formula by using the same prefixes as hydrates.

Ex. CS_2

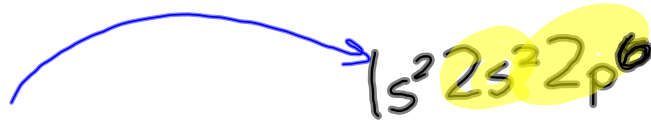
see Table 9.4 p. 269

The prefix system is usually not used for hydrogen molecular compounds

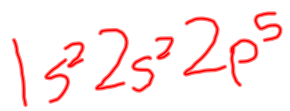
Ex. water - H_2O

Br HONCI IF

$N_2O \rightarrow$ dinitrogen monoxide



F



Cl



Bonding Capacity

H - 1

C - 4

O - 2

S - 2

N - 3

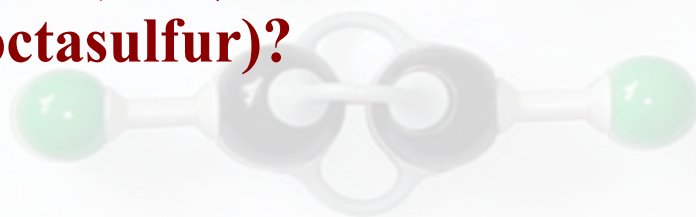
Cl - 1

H Hydrogen 3												4 3 2 1					He Helium 10
Li Lithium 11	Be Beryllium 12											B Boron 13	C Carbon 14	N Nitrogen 15	O Oxygen 16	F Fluorine 17	Ne Neon 18
Na Sodium 19	Mg Magnesium 20											Al Aluminium 31	Si Silicon 32	P Phosphorus 33	S Sulfur 34	Cl Chlorine 35	Ar Argon 36
K Potassium 37	Ca Calcium 38	Sc Scandium 21	Ti Titanium 22	V Vanadium 23	Cr Chromium 24	Mn Manganese 25	Fe Iron 26	Co Cobalt 27	Ni Nickel 28	Cu Copper 29	Zn Zinc 30	Ga Gallium 31	Ge Germanium 32	As Arsenic 33	Se Selenium 34	Br Bromine 35	Kr Krypton 36
Rb Rubidium 55	Sr Strontium 56	Y Yttrium 39	Zr Zirconium 40	Nb Niobium 41	Mo Molybdenum 42	Tc Technetium 43	Ru Ruthenium 44	Rh Rhodium 45	Pd Palladium 46	Ag Silver 47	Cd Cadmium 48	In Indium 49	Sn Tin 50	Sb Antimony 51	Te Tellurium 52	I Iodine 53	Xe Xenon 54
Cs Cesium 87	Ba Barium 88	La Lanthanum 57	Hf Hafnium 72	Ta Tantalum 73	W Tungsten 74	Re Rhenium 75	Os Osmium 76	Ir Iridium 77	Pt Platinum 78	Au Gold 79	Hg Mercury 80	Tl Thallium 81	Pb Lead 82	Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Fr Francium 87	Ra Radium 88	Ac Actinium 89	Rf Rutherfordium 104	Db Dubnium 105	Sg Seaborgium 106	Bh Bohrium 107	Hs Hassium 108	Mt Meitnerium 109									

58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium

Molecular Models

What are the three-dimensional structures of the molecular substances: water (H₂O), hydrogen peroxide (H₂O₂), hydrogen sulfide (H₂S), methane (CH₄), methanol (CH₃OH), ethanol (C₂H₅OH), propane (C₃H₈), ammonia (NH₃), chlorine and sulfur (cyclooctasulfur)?



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Name	Molecular Formula	Structural Diagram
water	H_2O	