Chemistry 20 – Lesson 3
Naming compounds

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1.

	Name	**Formula**
e.g. strontium and arsenic	strontium arsenide	$Sr_3As_{2\ (s)}$
a) silver and iodine	**silver iodide**	**$AgI_{(s)}$**
b) magnesium and oxygen	**magnesium oxide**	**$MgO_{(s)}$**
c) magnesium and bromine	**magnesium bromide**	**$MgBr_{2\ (s)}$**
d) calcium and nitrogen	**calcium nitride**	**$Ca_3N_{2\ (s)}$**
e) zinc and selenium	**zinc selenide**	**$ZnSe_{(s)}$**
f) sodium and sulfur	**sodium sulfide**	**$Na_2S_{(s)}$**
g) barium and phosphorus	**barium phosphide**	**$Ba_3P_{2\ (s)}$**
h) aluminium and fluorine	**aluminum fluoride**	**$AlF_{3\ (s)}$**
i) potassium and chlorine	**potassium chloride**	**$KCl_{(s)}$**
j) silver and oxygen	**silver oxide**	**$Ag_2O_{(s)}$**

2.

	Name	**Formula**
e.g. niobium and oxygen	niobium (V) oxide	$Nb_2O_{5\ (s)}$
a) iron and sulfur	**iron (III) sulfide**	**$Fe_2S_{3\ (s)}$**
b) copper and oxygen	**copper (II) oxide**	**$CuO_{(s)}$**
c) manganese and fluorine	**manganese (II) fluoride**	**$MnF_{2\ (s)}$**
d) gold and nitrogen	**gold (III) nitride**	**$AuN_{(s)}$**
e) chromium and chlorine	**chromium (III) chloride**	**$CrCl_{3\ (s)}$**
f) platinum and phosphorus	**platinum (IV) phosphide**	**$Pt_3P_{4\ (s)}$**
g) nickel and oxygen	**nickel (II) oxide**	**$NiO_{(s)}$**
h) cobalt and bromine	**cobalt (II) bromide**	**$CoBr_{2\ (s)}$**
i) tungsten and iodine	**tungsten (VI) iodide**	**$WI_{6\ (s)}$**
j) manganese and sulfur	**manganese (II) sulfide**	**$MnS_{(s)}$**

3. Complete the following table.

COMBINE	FORMULA	NAME
iron (II) & nitrate	$Fe(NO_3)_{2\ (s)}$	iron (II) nitrate
aluminium & nitrate	**$Al(NO_3)_{3\ (s)}$**	**aluminum nitrate**
sodium & sulfate	**$Na_2SO_{4\ (s)}$**	**sodium sulfate**
lead (IV) & sulfate	**$Pb(SO_4)_{2\ (s)}$**	**lead (IV) sulfate**
magnesium & carbonate	**$MgCO_{3\ (s)}$**	**magnesium carbonate**
gold (III) & sulfite	**$Au_2(SO_3)_{3\ (s)}$**	**gold (III) sulfite**
zinc & hydrogen carbonate	**$Zn(HCO_3)_{2\ (s)}$**	**zinc hydrogen carbonate**
ammonium & nitrate	**$NH_4NO_{3\ (s)}$**	**ammonium nitrate**
copper (I) & phosphate	**$Cu_3PO_{4\ (s)}$**	**copper (I) phosphate**
silver & hydroxide	**$AgOH_{\ (s)}$**	**silver hydroxide**
aluminium & hydroxide	**$Al(OH)_{3\ (s)}$**	**aluminium hydroxide**
lead (II) & phosphate	**$Pb_3(PO_4)_{2\ (s)}$**	**lead (II) phosphate**
potassium & acetate	**$KCH_3COO_{\ (s)}$**	**potassium acetate**
manganese (V) & sulfate	**$Mn_2(SO_4)_{5\ (s)}$**	**manganese (V) sulfate**

4. Complete the following table.

	Formula	Description or Use [*for interest only*]		Name of Compound
	e.g., CCl_4	toxic cleaning fluid and solvent		carbon tetrachloride
1.	**N_2**	composition of air	78.03%	nitrogen
2.	**O_2**		20.99%	oxygen
3.	**Ar**		0.94%	argon
4.	CO_2		0.035%	**carbon dioxide**
5.	**Ne, Kr**		0.0016%	other noble gases
6.	NO	air pollutants	in automobile exhaust	**nitrogen monoxide**
7.	NO_2		Los Angeles-type smog	**nitrogen dioxide**
8.	**SO_2**		London-type smog	sulfur dioxide
9.	SO_3		becomes sulfuric acid	**sulphur trioxide**
10.	**CO**		colorless, oderless poison	carbon monoxide
11.	**O_3**		good in upper atmosphere	ozone
12.	**C_2H_5OH**	grain alcohol, ethyl alcohol		ethanol
13.	**$C_{12}H_{22}O_{11}$**	table sugar		sucrose
14.	**S_8**	yellow solid in Group 16		sulfur
15.	P_4O_{10}	oxides formed by burning white phosphorus in air		**tetraphosphorous decaoxide**
16.	P_4O_6			**tetraphosphorous hexaoxide**
17.	**ClO_2**	chlorination of water		chlorine dioxide
18.	**CH_3OH**	methyl alcohol, methyl hydrate		methanol
19.	**P_4**	a white solid		phosphorus
20.	**NH_3**	a cleaner when dissolved in water		ammonia
21.	CH_4	85 - 95% of natural gas		**methane**
22.	HCl	a gas; in water is hydrochloric acid		**hydrogen chloride**
23.	**N_2O**	laughing gas, anaesthetic		dinitrogen oxide
24.	**I_2**	tincture of iodine in alcohol		iodine
25.	H_2O	the most common solvent		**water**

5. Complete the following table.

	Chemical Formula	Description or Use [*for Interest only*]	Name of Compound
e.g.	$CaCl_{2\,(s)}$	white solid; wetting agent	calcium chloride
1.	**KI**	dietary supplement for iodine	potassium iodide
2.	$MgO_{\,(s)}$	white powder; magnesium ore	**magnesium oxide**
3.	**$AlCl_3$**	antiperspirant	aluminum chloride
4.	$NaBr_{\,(s)}$	in Epsom Salts	**sodium bromide**
5.	$Al_2O_{3\,(s)}$	whiting; aluminum ore	**aluminum oxide**
6.	**Li_3N**	black; lithium reacts with air	lithium nitride
7.	$CaO_{\,(s)}$	white powder; quicklime	**calcium oxide**
8.	**$BaCl_2$**	white solid like $CaCl_2$	barium chloride
9.	**NaCl**	white solid; table salt	sodium chloride
10.	$ZnO_{\,(s)}$	protective oxide on zinc metal	**zinc oxide**
11.	**AgBr**	photographic emulsion	silver bromide
12.	**MgH_2**	magnesium reacts with hydrogen	magnesium hydride
13.	**$MgCl_2$**	11 % of minerals in sea water	magnesium chloride
14.	**$ZnCl_2$**	in soldering paste	zinc chloride
15.	$Ag_2S_{\,(s)}$	argentite (silver ore)	**silver sulfide**
16.	**KCl**	potash (fertilizer)	potassium chloride
17.	$CaF_{2\,(s)}$	fluorite (pretty mauve crystals)	**calcium fluoride**
18.	**Na_2S**	for toning pictures brown	sodium sulfide
19.	$CaH_{2\,(s)}$	preparation of hydrogen	**calcium hydride**
20.	**ZnS**	zinc blende (zinc ore)	zinc sulfide

6. Complete the following table.

	Chemical Formula	**Description or Use** [*for interest only*]	**Name of Compound**
e.g.,	Cu_2S	copper ore (chalcocite)	copper(I) sulfide
1.	**UO_2**	uranium ore (uraninite)	uranium (IV) oxide
2.	**PbS_2**	lead ore (galena)	lead (IV) sulfide
3.	SnO_2	tin ore (cassiterite)	**tin (IV) oxide**
4.	**MnO_2**	manganese ore (pyrolusite)	manganese (IV) oxide
5.	Sb_2S_3	antimony ore (stibnite)	**antimony (III) sulfide**
6.	FeO	iron ore (hematite)	**iron (II) oxide**
7.	HgS	mercury ore (cinnabar)	**mercury (II) sulfide**
8.	MoS_2	molybdenum ore (molybdenite)	**molybdenum (IV) sulfide**
9.	**CuS**	copper ore (chalcopyrite)	copper (II) sulfide
10.	FeS	also in chalcopyrite	**iron (II) sulfide**
11.	**PbO_2**	electrode In car battery	lead (IV) oxide
12.	HgO	laboratory preparation of oxygen	**mercury (II) oxide**
13.	V_2O_5	a common catalyst	**vanadium (V) oxide**
14.	**SnF_2**	toothpaste additive	tin (II) fluoride
15.	**Cr_2O_3**	a green paint pigment	chromium (III) oxide
16.	TiO_2	a white paint pigment	**titanium (IV) oxide**
17.	$AuCl_3$	gold tinting of pictures	**gold (III) chloride**
18.	**UF_6**	separating types of U atoms	uranium (VI) fluoride
19.	$NiBr_2$	forms a green solution	**nickel (II) bromide**
20.	**$CoCl_2$**	forms a pink solution	cobalt (II) chloride

7. Complete the following table.

	i or m	Chemical Formula	Name of Compound
1.	**i**	K_2CO_3	**potassium carbonate**
2.	**i**	$(NH_4)_2S$	**ammonium sulfide**
3.	**i**	**$Ca(OH)_2$**	calcium hydroxide
4.	**i**	**$MgSiO_3$**	magnesium silicate
5.	**i**	**$Fe(ClO_2)_2$**	iron (II) chlorite
6.	**i**	$Cr(NO_3)_3$	**chromium (III) nitrate**
7.	**i**	**$K_2Cr_2O_7$**	potassium dichromate
8.	**m**	SO_3	**sulphur trioxide**
9.	**i**	$NaNO_2$	**sodium nitrite**
10.	**i**	**$(NH_4)_2SO_4$**	ammonium sulfate
11.	**i**	**$NaHCO_3$**	sodium hydrogen carbonate
12.	**i**	K_3PO_4	**potassium phosphate**
13.	**i**	**$K_2OOCCOO$**	potassium oxalate
14.	**m**	NH_3	**ammonia**
15.	**i**	**$NaNO_3$**	sodium nitrate
16.	**i**	$KMnO_4$	**potassium permanganate**
17.	**i**	**$Na_2S_2O_3$**	sodium thiosulfate
18.	**m**	CO_2	**carbon dioxide**
19.	**i**	**$Ba(ClO_4)_2$**	barium perchlorate
20.	**i**	**RbHS**	rubidium hydrogen sulfide
21.	**i**	**KCN**	potassium cyanide
22.	**i**	$NH_4H_2PO_4$	**ammonium dihydrogen phosphate**
23.	**i**	**$NaHSO_3$**	sodium hydrogen sulfite
24.	**i**	Na_2SO_4	**sodium sulfate**
25.	**i**	**KSCN**	potassium thiocyanate

8. Complete the following table.

	Name of Hydrate	Common Name, Use or Description	Formula
e.g.,	copper (II) sulfate pentahydrate	blue vitriol, bluestone, copper plating, blue solid	$CuSO_4 \cdot 5H_2O$
1.	**magnesium sulphate heptahydrate**	Epsom salts, white solid explosives, matches	$MgSO_4 \cdot 7H_2O$
2.	sodium carbonate decahydrate	washing soda, soda ash, water softener, white solid	**$Na_2CO_3 \cdot 10H_2O$**
3.	**magnesium chloride hexahydrate**	white solid, fireproofing wood, disinfectants, parchment paper	$MgCl_2 \cdot 6H_2O$
4.	barium chloride dihydrate	white solid, pigments, dyeing fabrics, tanning leather	**$BaCl_2 \cdot 2H_2O$**
5.	**cadmium nitrate tetrahydrate**	white solid, photographic emulsions	$Cd(NO_3)_2 \cdot 4H_2O$
6.	**zinc chloride hexahydrate**	white solid, embalming material, fireproofing lumber, vulcanizing	$ZnCl_2 \cdot 6H_2O$
7.	zinc sulfate heptahydrate	white solid, clarifying glue, preserving wood and skins	**$ZnSO_4 \cdot 7H_2O$**
8.	lithium chloride tetrahydrate	white solid, soldering aluminum, in fireworks	**$LiCl \cdot 4H_2O$**
9.	**sodium thosulfate pentahydrate**	photographic hypo, antichlor, white solid	$Na_2S_2O_3 \cdot 5H_2O$
10.	cobalt (II) chloride hexahydrate	pink solid, humidity and water indicator, foam stabilizer in beer	**$CoCl_2 \cdot 6H_2O$**
11.	**aluminum chloride hexahydrate**	white solid, antiperspirant	$AlCl_3 \cdot 6H_2O$
12.	**calcium chloride dihydrate**	de-icer used on icy highways, added to cement mixtures to prevent freezing	$CaCl_2 \cdot 2H_2O$
13.	barium hydroxide octahydrate	white solid, manufacture of glass, water softener	**$Ba(OH)_2 \cdot 8H_2O$**
14.	nickel (II) chloride hexahydrate	green solid, absorbent for ammonia in gas masks	**$NiCl_2 \cdot 6H_2O$**
15.	**sodium sulphate decahydrate**	Glauber's salt (a medicine), white solid, drying agent	$Na_2SO_4 \cdot 10H_2O$

9. Complete the following table. Classify the substance as ionic or molecular (i or m) in the first column. Use a subscript to indicate the state of matter of each substance (s, l, or g at room temperature).

	i or m	Chemical Formula	Name of Compound		i or m	Chemical Formula	Name of Compound
1.	**i**	$Al(OH)_3$	**aluminum hydroxide**	26.	**i**	**$MgSO_4 \cdot 7H_2O$**	magnesium sulfate heptahydrate
2.	**i**	**$Na_2SO_4 \cdot 10H_2O$**	sodium sulfate decahydrate	27.	**i**	$Ca(OH)_2$	**calcium hydroxide**
3.	**i**	**$NaNO_3 \cdot 6H_2O$**	sodium nitrate hexahydrate	28.	**i**	**$Na_2S_2O_3$**	sodium thiosulfate
4.	**i**	$Al_3(SO_4)_3$	**aluminum sulphate**	29.	**i**	CaO	**calcium oxide**
5.	**i**	**$CaCl_2 \cdot 6H_2O$**	calcium chloride hexahydrate	30.	**i**	**$CuSO_4 \cdot 5H_2O$**	copper (II) sulfate pentahydrate
6.	**i**	NH_4NO_3	**ammonium nitrate**	31.	**m**	**S_8**	sulfur
7.	**m**	**PH_3**	phosphorus trihydride	32.	**m**	$BrH_{6\ (g)}$	**bromine hexahydride**
8.	**m**	$N_2O_{4\ (g)}$	**dinitrogen tetraoxide**	33.	**i**	**$K_2Cr_2O_7$**	potassium dichromate
9.	**m**	**CH_4**	methane	34.	**m**	**P_4**	phosphorus
10.	**i**	K_2SO_4	**potassium sulphate**	35.	**m**	SO_3	**sulphur trioxide**
11.	**i**	Fr_3PO_4	**francium phosphate**	36.	**i**	**$NaClO_3$**	sodium chlorate
12.	**i**	**$Bi_3(BO_3)_5$**	bismuth (V) borate	37.	**i**	Na_2SiO_3	**sodium silicate**
13.	**i**	$(NH_4)_2SO_4$	**ammonium sulphate**	38.	**m**	**CH_3OH**	methanol
14.	**i**	SnF_4	**tin (IV) fluoride**	39.	**m**	**Cl_2**	chlorine
15.	**m**	**$XeBr_6$**	xenon hexabromide	40.	**i**	**$PbSO_4$**	lead (II) sulfate
16.	**i**	PbO_2	**lead (IV) oxide**	41.	**i**	$Ca(HCO_3)_2$	**calcium hydrogen carbonate**
17.	**m**	**SiO_2**	silicon dioxide	42.	**m**	**NCl_3**	nitrogen trichloride
18.	**i**	NaClO	**sodium hypochlorite**	43.	**i**	**$NaHSO_3$**	sodium hydrogen sulfite
19.	**i**	**$KMnO_4$**	potassium permanganate	44.	**m**	CO	**carbon monoxide**
20.	**i**	KNO_3	**potassium nitrate**	45.	**m**	H_2Se	**dihydrogen selenide**
21.	**i**	$K_2CO_3 \cdot 2H_2O$	**potassium carbonate dihydrate**	46.	**m**	**SiC**	silicon carbide
22.	**m**	**HF**	hydrogen fluoride	47.	**i**	**$AlPO_4$**	aluminum phosphate
23.	**m**	$H_2S_{(g)}$	**hydrogen sulfide**	48.	**i**	**$LiNO_3$**	lithium nitrate
24.	**i**	**NaOH**	sodium hydroxide	49.	**m**	SF_2	**sulphur difluoride**
25.	**i**	$NaHSO_4$	**sodium hydrogen sulphate**	50.	**m**	$H_2O_{2\ (aq)}$	**hydrogen peroxide**