

Nomenclature Review

15. Write the chemical formula (plus state) for each of the following substances:

- (a) sodium hydrogen sulfate (toilet bowl cleaner) NaHSO_4
 (b) sodium hydroxide (lye, drain cleaner) NaOH
 (c) carbon dioxide (dry ice, soda pop) CO_2
 (d) acetic acid (vinegar) CH_3COOH or $\text{HC}_2\text{H}_3\text{O}_2$
 (e) sodium thiosulfate pentahydrate (photographic "hypo") $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$
 (f) sodium hypochlorite (laundry bleach) NaClO
 (g) octasulfur (vulcanizing rubber) S_8
 (h) potassium nitrate (meat preservative) KNO_3
 (i) phosphoric acid (rust remover) $\text{H}_3\text{PO}_4(\text{aq})$
 (j) iodine (disinfectant) I_2
 (k) aluminum oxide (alumina, aluminum ore) Al_2O_3
 (l) potassium hydroxide (caustic potash) KOH
 (o) aqueous hydrogen carbonate (carbonated beverages) H_2CO_3

16. Write the chemical formula for each of the following substances:

- (a) magnesium bromide MgBr_2
 (b) carbon disulfide CS_2
 (c) mercury(II) nitrite $\text{Hg}(\text{NO}_2)_2$
 (d) hydrochloric acid $\text{HCl}(\text{aq})$
 (e) lithium hydroxide LiOH
 (f) silver carbonate Ag_2CO_3
 (g) aluminum perchlorate $\text{Al}(\text{ClO}_4)_3$
 (h) copper(II) sulfate CuSO_4
 (i) sulfur trioxide SO_3
 (j) nickel(III) phosphate NiPO_4
 (k) magnesium oxide MgO
 (l) dinitrogen monoxide N_2O
 (m) iron(II) persulfate FeSO_5
 (n) carbonic acid H_2CO_3
 (o) calcium hydroxide $\text{Ca}(\text{OH})_2$
 (p) zinc hypochlorite $\text{Zn}(\text{ClO})_2$
 (q) lead(IV) perchlorate $\text{Pb}(\text{ClO}_4)_4$
 (r) phosphorous pentabromide PBr_5
 (s) arsenic(V) chloride AsCl_5
 (t) bismuth(III) nitrate $\text{Bi}(\text{NO}_3)_3$
 (u) sodium hypochlorite NaClO
 (v) oxygen dichloride OCl_2
 (w) tin(II) bromide SnBr_2
 (x) sulfuric acid H_2SO_4
 (y) potassium hydroxide KOH
 (z) barium carbonate BaCO_3

17. Write the chemical formula for each of the following substances:

- (a) ammonium dihydrogen phosphite $\text{NH}_4\text{H}_2\text{PO}_3$
 (b) lithium hydrogen sulfite LiHSO_3
 (c) potassium hydrogen sulfate KHSO_4
 (d) barium chloride trihydrate $\text{BaCl}_2 \cdot 3\text{H}_2\text{O}$
 (e) sodium dihydrogen phosphate NaH_2PO_4
 (f) sodium hydrogen carbonate NaHCO_3

18. Give the names of the following substances, using IUPAC chemical nomenclature:

- (a) $\text{CaCO}_3(\text{s})$ (marble, limestone, chalk) calcium carbonate
 (b) $\text{P}_2\text{O}_5(\text{s})$ (fertilizer) diphosphorus pentoxide
 (c) $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}(\text{s})$ (Epsom salts)
 (d) $\text{N}_2\text{O}(\text{g})$ (laughing gas, an anesthetic) dinitrogen monoxide
 (e) $\text{Na}_2\text{SiO}_3(\text{s})$ (water glass) sodium silicate
 (f) $\text{Ca}(\text{HCO}_3)_2(\text{s})$ (hard-water chemical)
 (g) $\text{HCl}(\text{aq})$ (muriatic acid, gastric fluid) hydrochloric acid
 (h) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s})$ (copperplating, bluestone)
 (i) $\text{H}_2\text{SO}_4(\text{aq})$ (acid in car battery) sulfuric acid
 (j) $\text{Ca}(\text{OH})_2(\text{s})$ (slaked lime) calcium hydroxide
 (k) $\text{SO}_3(\text{g})$ (a cause of acid rain) sulfur trioxide
 (l) $\text{NaF}(\text{s})$ (toothpaste additive) sodium fluoride

19. Give the IUPAC names of the following substances:

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|--|---|
| (a) $\text{NaCl}(\text{s})$ | (d) $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2(\text{s})$ |
| (b) $\text{P}_2\text{O}_3(\text{s})$ | (e) $\text{NH}_4\text{OCl}(\text{s})$ |
| (c) $\text{HNO}_3(\text{aq})$ | (f) $\text{Sn}(\text{BrO}_3)_4(\text{s})$ |
| (g) $\text{Sb}_2\text{O}_3(\text{s})$ | (q) $\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2(\text{s})$ |
| (h) $\text{Zn}(\text{IO}_3)_2(\text{s})$ | (r) $\text{ICl}(\text{s})$ |
| (i) $\text{Fe}(\text{NO}_4)_2(\text{s})$ | (s) $\text{AuCl}_3(\text{s})$ |
| (j) $\text{Ca}(\text{OH})_2(\text{s})$ | (t) $\text{MgS}(\text{s})$ |
| (k) $\text{KI}(\text{s})$ | (u) $\text{N}_2\text{F}_2(\text{g})$ |
| (l) $\text{SF}_2(\text{g})$ | (v) $\text{NiSO}_4(\text{s})$ |
| (m) $\text{HBr}(\text{aq})$ | (w) $\text{H}_2\text{S}(\text{aq})$ |
| (n) $\text{CuCO}_3(\text{s})$ | (x) $\text{AgBrO}_3(\text{s})$ |
| (o) $\text{Al}_2(\text{SO}_3)_3(\text{s})$ | (y) $\text{LiClO}_4(\text{s})$ |
| (p) $\text{NH}_4\text{OH}(\text{l})$ | |

20. Give the names of the following substances, using IUPAC chemical nomenclature:

- (a) $\text{CaHPO}_4(\text{s})$ (d) $\text{LiHCO}_3(\text{s})$
 (b) $\text{CuSO}_4 \cdot 7\text{H}_2\text{O}(\text{s})$ (e) $\text{KHSO}_4(\text{s})$
 (c) $\text{Na}_2\text{HPO}_4(\text{s})$

21. Write the name and formula (with state at SATP) for the compound formed by each of the following pairs of elements. Where a molecular compound is formed, give the structural formula. For ionic compounds, assume the most common ion charges for the ions.

- (a) potassium and bromine KBr
 (b) silver and iodine AgI
 (c) lead and oxygen PbO
 (d) zinc and sulfur ZnS
 (e) copper and oxygen CuO
 (f) lithium and nitrogen Li_3N

20. a) calcium hydrogen phosphate
 b) copper(II) sulfate heptahydrate
 c) sodium hydrogen phosphate
 d) lithium hydrogen carbonate
 e) potassium hydrogen sulfate

18. c) magnesium sulfate heptahydrate
f) calcium hydrogen carbonate
h) copper (II) sulfate pentahydrate
19. a) sodium chloride
b) diphosphorus trioxide
c) nitric acid
d) lead (II) acetate
e) ammonium hypochlorite
f) tin (IV) bromate
g) antimony (III) oxide
h) zinc iodate
i) iron (II) pernitrate
j) calcium hydroxide
k) potassium iodide
l) sulfur difluoride
m) hydrobromic acid
n) copper (II) carbonate
o) aluminum sulfite
p) ammonium hydroxide
q) barium acetate
r) iodine monochloride
s) gold (III) chloride
t) magnesium sulfide
u) dinitrogen difluoride
v) nickel (II) sulfate
w) hydrosulfuric acid
x) silver bromate
y) lithium perchlorate