

Nomenclature Exercise #1 - Naming Simple Binary Compounds

Name each of the following simple binary compounds.

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|---------------|---------------------|---------------|--------------------|
| 1. H_2O | hydrogen oxide | 11. Na_2S | sodium sulfide |
| 2. Li_2O | lithium oxide | 12. KI | potassium iodide |
| 3. SrO | strontium oxide | 13. CaO | calcium oxide |
| 4. Al_2O_3 | aluminum oxide | 14. BeI_2 | beryllium iodide |
| 5. $NaCl$ | sodium chloride | 15. $AlCl_3$ | aluminum chloride |
| 6. MgS | magnesium sulfide | 16. AlP | aluminum phosphide |
| 7. $CaBr_2$ | calcium bromide | 17. $LiBr$ | lithium bromide |
| 8. K_3P | potassium phosphide | 18. Rb_3N | rubidium nitride |
| 9. $RbCl$ | rubidium chloride | 19. RbF | rubidium fluoride |
| 10. Sr_3P_2 | strontium phosphide | 20. Al_2P_3 | aluminum phosphide |

Nomenclature Exercise #2 - Creating Simple Binary Formulas

Write formulas for each of the following simple binary compounds.

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| 1. Lithium sulphide | Li_2S | 11. Hydrogen nitride | H_3N |
| 2. Potassium bromide | KBr | 12. Potassium chloride | KCl |
| 3. Cesium iodide | CsI | 13. Lithium nitride | Li_3N |
| 4. Calcium phosphide | Ca_3P_2 | 14. Beryllium oxide | BeO |
| 5. Sodium fluoride | NaF | 15. Sodium iodide | NaI |
| 6. Strontium oxide | SrO | 16. Magnesium oxide | MgO |
| 7. Beryllium sulphide | BeS | 17. Potassium chloride | KCl |
| 8. Magnesium bromide | $MgBr_2$ | 18. Calcium sulphide | CaS |
| 9. Lithium oxide | Li_2O | 19. Rubidium oxide | Rb_2O |
| 10. Strontium chloride | $SrCl_2$ | 20. Strontium nitride | Sr_3N_2 |

Nomenclature Exercise #3 - Creating Formulas for the Polyatomic Ions of 1+, 3- and 2-

Using the positive and negative ions given below make up the correct formulas.

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| 1. NH_4^+ and PO_4^{3-} | $(\text{NH}_4)_3\text{PO}_4$ | 11. Ca^{2+} and SO_4^{2-} | CaSO_4 |
| 2. H^+ and BO_3^{3-} | H_3BO_3 | 12. Sr^{2+} and CO_3^{2-} | SrCO_3 |
| 3. Li^+ and CO_3^{2-} | Li_2CO_3 | 13. Ba^{2+} and BO_3^{3-} | $\text{Ba}_3(\text{BO}_3)_2$ |
| 4. Na^+ and SO_4^{2-} | Na_2SO_4 | 14. B^{3+} and PO_4^{3-} | BPO_4 |
| 5. K^+ and CrO_4^{2-} | K_2CrO_4 | 15. NH_4^+ and HPO_4^{2-} | $(\text{NH}_4)_2\text{HPO}_4$ |
| 6. Rb^+ and $\text{Cr}_2\text{O}_7^{2-}$ | $\text{Rb}_2\text{Cr}_2\text{O}_7$ | 16. H^+ and $\text{Cr}_2\text{O}_7^{2-}$ | $\text{H}_2\text{Cr}_2\text{O}_7$ |
| 7. Cs^+ and HPO_4^{2-} | Cs_2HPO_4 | 17. Rb^+ and CO_3^{2-} | Rb_2CO_3 |
| 8. Be^{2+} and $\text{Cr}_2\text{O}_7^{2-}$ | BeCr_2O_7 | 18. Ca^{2+} and HPO_4^{2-} | CaHPO_4 |
| 9. Mg^{2+} and CrO_4^{2-} | MgCrO_4 | 19. B^{3+} and $\text{Cr}_2\text{O}_7^{2-}$ | $\text{B}_2(\text{Cr}_2\text{O}_7)_3$ |
| 10. B^{3+} and HPO_4^{2-} | $\text{B}_2(\text{HPO}_4)_3$ | 20. Be^{2+} and BO_3^{3-} | $\text{Be}_3(\text{BO}_3)_2$ |

Using the IUPAC names below come up with the correct formulas.

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|----------------------------------|-----------------------------------|-----------------------------------|---------------------------|
| 1. Ammonium borate | $(\text{NH}_4)_3\text{BO}_3$ | 8. Hydrogen phosphate | H_3PO_4 |
| 2. Potassium phosphate | K_3PO_4 | 9. Cesium borate | Cs_3BO_3 |
| 3. Beryllium sulphate | BeSO_4 | 10. Sodium carbonate | Na_2CO_3 |
| 4. Hydrogen chromate | H_2CrO_4 | 11. Strontium dichromate | SrCr_2O_7 |
| 5. Sodium monohydrogen phosphate | Na_2HPO_4 | 12. Barium monohydrogen phosphate | BaHPO_4 |
| 6. Boron chromate | B_2CrO_4 | 13. Barium chromate | BaCrO_4 |
| 7. Potassium dichromate | $\text{K}_2\text{Cr}_2\text{O}_7$ | 14. Lithium sulphate | Li_2SO_4 |

Give the Correct IUPAC names for the following molecular formulas.

1. $(\text{NH}_4)_2\text{CO}_3$ ammonium carbonate
2. Rb_2HPO_4 rubidium monohydrogen phosphate
3. $\text{Li}_2\text{Cr}_2\text{O}_7$ lithium dichromate
4. MgHPO_4 magnesium monohydrogen phosphate
5. SrHPO_4 strontium monohydrogen phosphate
6. Na_3BO_3 sodium borate
7. H_2SO_4 hydrogen sulfate
8. $\text{Sr}_3(\text{PO}_4)_2$ strontium phosphate
9. Rb_3PO_4 rubidium phosphate
10. Rb_2CrO_4 rubidium chromate
11. MgCr_2O_7 magnesium dichromate
12. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ ammonium dichromate
13. Cs_2CO_3 cesium carbonate
14. $\text{Ca}_3(\text{BO}_3)_2$ calcium borate
15. SrCrO_4 strontium chromate
16. $\text{B}_2(\text{CO}_3)_3$ boron carbonate

Nomenclature Exercise #4 - Creating Formulas for the Polyatomic I- Ions

Using the IUPAC names below come up with the correct molecular formulas.

1. Ammonium cyanide NH_4CN
2. Potassium nitrate KNO_3
3. Beryllium hydroxide $\text{Be}(\text{OH})_2$
4. Cesium permanganate CsMnO_4
5. Boron iodate $\text{B}(\text{IO}_3)_3$
6. Sodium bicarbonate NaHCO_3
7. Rubidium dihydrogen phosphate RbH_2PO_4
8. Ammonium hydroxide NH_4OH
9. Sodium chlorate NaClO_3
10. Rubidium iodate RbIO_3
11. Potassium permanganate KMnO_4
12. Cesium bicarbonate CsHCO_3
13. Sodium hydroxide NaOH
14. Hydrogen cyanide HCN
15. Barium bisulfate $\text{Ba}(\text{HSO}_4)_2$
16. Cesium nitrate CsNO_3
17. Magnesium permanganate $\text{Mg}(\text{MnO}_4)_2$
18. Calcium cyanide $\text{Ca}(\text{CN})_2$

Given the formulas below provide the correct IUPAC name.

1. HOH hydrogen hydroxide
2. LiCN lithium cyanide
3. RbNO₃ rubidium nitrate
4. Be(ClO₃)₂ beryllium chlorate
5. Ca(MnO₄)₂ calcium permanganate
6. HCH₃COO hydrogen acetate.
7. NH₄HCO₃ ammonium bicarbonate
8. Ba(IO₃)₂ barium iodate.
9. Mg(HSO₄)₂ magnesium bisulfate
10. Sr(NO₃)₂ strontium nitrate.
11. LiHCO₃ lithium bicarbonate
12. KHSO₄ potassium bisulfate
13. CsIO₃ cesium iodate
14. NH₄H₂PO₄ ammonium dihydrogen phosphate
15. RbOH rubidium hydroxide
16. Be(CN)₂ beryllium cyanide.
17. Ca(NO₃)₂ calcium nitrate
18. KClO₃ potassium chlorate
19. CsCH₃COO cesium acetate
20. KHCO₃ potassium bicarbonate.

Nomenclature Exercise #5 - Creating Formulas for the Transition Metals

Using the IUPAC formulas below come up with correct names

1. ScCl₃ scandium chloride
2. Cr(NO₃)₆ chromium (VI) nitrate
3. MnO manganese (II) oxide
4. Fe(MnO₄)₂ iron (II) permanganate
5. CoF₃ cobalt (III) fluoride.
6. Ni₃(PO₄)₂ nickel (II) phosphate
7. CuCl₂ copper (II) chloride
8. ZnO zinc oxide.
9. GeS₂ germanium sulfide
10. AgCl silver chloride
11. PtO₂ platinum (IV) oxide
12. Zn₃P₂ zinc phosphide
13. Sn(HSO₄)₄ tin (IV) bisulfate
14. Au₂O₃ gold (III) oxide
15. Bi₃(BO₃)₅ bismuth (V) borate
16. NiN nickel (III) nitride
17. TiO₂ titanium (IV) oxide
18. VSO₄ vanadium (II) sulfate
19. Cr(H₂PO₄)₃ chromium (III) dihydrogen phosphate
20. W(MnO₄)₄ tungsten (IV) permanganate

Given the names below provide the correct IUPAC formulas.

- Chromium (II) sulphate CrSO_4
- Manganese (IV) phosphide Mn_3P_4
- Iron (III) sulphide FeS
- Cobalt (II) dichromate CoCr_2O_7
- Nickel (III) nitride Ni_3N
- Copper (I) cyanide CuCN
- Zinc carbonate ZnCO_3
- Cadmium phosphate $\text{Cd}_3(\text{PO}_4)_2$
- Mercury (II) iodide HgI_2
- Gold (III) permanganate $\text{Au}(\text{MnO}_4)_3$

Nomenclature Exercise #6 - Creating Formulas for Non-metal to Non-metal Compounds

Using the names below come up with the correct formulas.

- Carbon dioxide CO_2
- Bromine monoxide BrO
- Iodine monochloride ICl
- Antimony trifluoride SbF_3
- Bromine dioxide BrO_2
- Carbon monosulphide CS
- Phosphorus tribromide PBr_3
- Dinitrogen tetraoxide N_2O_4
- Chlorine trifluoride ClF_3
- Phosphorus pentachloride PCl_5
- Bromine monofluoride BrF
- Dinitrogen pentoxide N_2O_5
- Carbon tetraiodide CI_4
- Tellurium dioxide TeO_2

Given the formulas below provide the correct names.

1. SiC silicon monocrbide
2. SiO_2 silicon dioxide
3. SbBr_3 antimony tribromide
4. IBr iodine monobromide
5. SiCl_4 silicon tetrachloride
6. N_2O dinitrogen monoxide
7. CSe_2 carbon diselenide
8. CS_2 carbon disulfide
9. CO carbon monoxide
10. BrF_5 bromine pentafluoride
11. SbCl_3 antimony trichloride
12. IF_5 iodine pentafluoride
13. SO_2 sulfur dioxide.