

Naming Ionic Compounds – Answer Key

Give the name of the following ionic compounds:

| | | Name |
|-----|-------------------------------|-------------------------------|
| 1) | Na_2CO_3 | sodium carbonate |
| 2) | NaOH | sodium hydroxide |
| 3) | MgBr_2 | magnesium bromide |
| 4) | KCl | potassium chloride |
| 5) | FeCl_2 | iron (II) chloride |
| 6) | FeCl_3 | iron (III) chloride |
| 7) | Zn(OH)_2 | zinc hydroxide |
| 8) | Be_2SO_4 | beryllium sulfate |
| 9) | CrF_2 | chromium (II) fluoride |
| 10) | Al_2S_3 | aluminum sulfide |
| 11) | PbO | lead (II) oxide |
| 12) | Li_3PO_4 | lithium phosphate |
| 13) | TiI_4 | titanium (IV) iodide |
| 14) | Co_3N_2 | cobalt (II) nitride |
| 15) | Mg_3P_2 | magnesium phosphide |
| 16) | $\text{Ga(NO}_2)_3$ | gallium nitrite |
| 17) | Ag_2SO_3 | silver sulfite |
| 18) | NH_4OH | ammonium hydroxide |
| 19) | Al(CN)_3 | aluminum cyanide |
| 20) | $\text{Be(CH}_3\text{COO)}_2$ | beryllium acetate |

For the following compounds, give the formulas:

| | Formula |
|----------------------------|--|
| 22) sodium phosphide | Na_3PO_4 |
| 23) magnesium nitrate | $\text{Mg}(\text{NO}_3)_2$ |
| 24) lead (II) sulfite | PbSO_3 |
| 25) calcium phosphate | $\text{Ca}_3(\text{PO}_4)_3$ |
| 26) ammonium sulfate | $(\text{NH}_4)_2\text{SO}_4$ |
| 27) silver cyanide | AgCN |
| 28) aluminum sulfide | Al_2S_3 |
| 29) beryllium chloride | BeCl_2 |
| 30) copper (I) arsenide | Cu_3As |
| 31) iron (III) oxide | Fe_2O_3 |
| 32) gallium nitride | GaN |
| 33) iron (II) bromide | FeBr_2 |
| 34) vanadium (V) phosphate | $\text{V}_3(\text{PO}_4)_5$ |
| 35) calcium oxide | CaO |
| 36) magnesium acetate | $\text{Mg}(\text{CH}_3\text{COO})_2$ |
| 37) aluminum sulfate | $\text{Al}_2(\text{SO}_4)_3$ |
| 38) copper (I) carbonate | Cu_2CO_3 |
| 39) barium oxide | BaO |
| 40) ammonium sulfite | $(\text{NH}_4)_2\text{SO}_3$ |
| 41) silver bromide | AgBr |
| 42) lead (IV) nitrite | $\text{Pb}(\text{NO}_2)_4$ |

Naming Covalent Compounds Solutions

Write the formulas for the following covalent compounds:

- 1) antimony tribromide **SbBr₃**
- 2) hexaboron silicide **B₆Si**
- 3) chlorine dioxide **ClO₂**
- 4) hydrogen iodide **HI**
- 5) iodine pentafluoride **IF₅**
- 6) dinitrogen trioxide **N₂O₃**
- 7) ammonia **NH₃**
- 8) phosphorus triiodide **PI₃**

Write the names for the following covalent compounds:

- 9) P₄S₅ **tetraphosphorus pentasulfide**
- 10) O₂ **oxygen**
- 11) SeF₆ **selenium hexafluoride**
- 12) Si₂Br₆ **disilicon hexafluoride**
- 13) SCl₄ **sulfur tetrachloride**
- 14) CH₄ **methane, carbon tetrahydride**
- 15) B₂Si **diboron silicide**
- 16) NF₃ **nitrogen trifluoride**

| | |
|--------------------------------|--------------------------------|
| hydrogen bromide | HBr |
| ammonia | NH ₃ |
| CO ₂ | carbon dioxide |
| dinitrogen pentoxide | N ₂ O ₅ |
| P ₂ O ₃ | diphosphorus trioxide |
| HF | hydrogen fluoride |
| H ₂ S | hydrogen sulfide |
| HCl | hydrogen chloride |
| CO | carbon monoxide |
| NO | nitrogen monoxide |
| SF ₆ | sulfur hexafluoride |
| sulfur trioxide | SO ₃ |
| tetraphosphorus decoxide | P ₄ O ₁₀ |
| disulfur dichloride | S ₂ Cl ₂ |
| boron trifluoride | B ₂ F ₃ |
| carbon tetrachloride | CCl ₄ |
| iodine monochloride | ICl |
| sulfur trioxide | SO ₃ |
| hydrogen sulfide | H ₂ S |
| carbon tetrachloride | CCl ₄ |
| H ₂ Se | hydrogen selenide |
| CS ₂ | carbon disulfide |
| NO ₂ | nitrogen dioxide |
| PCl ₅ | phosphorus pentachloride |
| sulfur dioxide | SO ₂ |
| CO ₂ | carbon dioxide |
| HF | hydrogen fluoride |
| NO ₂ | nitrogen dioxide |
| dinitrogen pentoxide | N ₂ O ₅ |
| carbon disulfide | CS ₂ |
| hydrogen fluoride | HF |
| diphosphorus trioxide | P ₂ O ₃ |
| P ₄ O ₁₀ | tetraphosphorus decoxide |

Naming Chemical Compounds - Answers

Name the following *ionic* compounds:

- | | | |
|----|---------------------|---------------------|
| 1) | NaBr | sodium bromide |
| 2) | CaO | calcium oxide |
| 3) | Li ₂ S | lithium sulfide |
| 4) | MgBr ₂ | magnesium bromide |
| 5) | Be(OH) ₂ | beryllium hydroxide |

Write the formulas for the following *ionic* compounds:

- | | | |
|-----|---------------------|--|
| 6) | potassium iodide | KI |
| 7) | magnesium oxide | MgO |
| 8) | aluminum chloride | AlCl ₃ |
| 9) | sodium nitrate | NaNO ₃ |
| 10) | calcium carbonate | CaCO ₃ |
| 11) | lithium sulfate | Li ₂ SO ₄ |
| 12) | beryllium phosphide | Be ₃ P ₂ |
| 13) | magnesium hydroxide | Mg(OH) ₂ |
| 14) | sodium phosphate | Na ₃ PO ₄ |
| 15) | aluminum carbonate | Al ₂ (CO ₃) ₃ |
| 16) | calcium chloride | CaCl ₂ |
| 17) | sodium cyanide | NaCN |
| 18) | aluminum oxide | Al ₂ O ₃ |
| 19) | magnesium acetate | Mg(C ₂ H ₃ O ₂) ₂ |
| 20) | ammonium chloride | NH ₄ Cl |

Write the names of the following *covalent* compounds:

- | | | |
|-----|-------------------------|----------------------------------|
| 21) | SO_3 | sulfur trioxide |
| 22) | N_2S | dinitrogen sulfide |
| 23) | PH_3 | phosphorus trihydride |
| 24) | BF_3 | boron trifluoride |
| 25) | P_2Br_4 | diphosphorus tetrabromide |
| 26) | CO | carbon monoxide |
| 27) | SiO_2 | silicon dioxide |
| 28) | SF_6 | sulfur hexafluoride |
| 29) | NH_3 | ammonia |
| 30) | NO_2 | nitrogen dioxide |

Write the formulas of the following *covalent* compounds:

- | | | |
|-----|--------------------------|--|
| 31) | nitrogen trichloride | NCl_3 |
| 32) | boron carbide | BC |
| 33) | dinitrogen trioxide | N_2O_3 |
| 34) | phosphorus pentafluoride | PF_5 |
| 35) | methane | CH_4 |
| 36) | sulfur dibromide | SBr_2 |
| 37) | diboron tetrahydride | B_2H_4 |
| 38) | oxygen difluoride | OF_2 |
| 39) | carbon disulfide | CS_2 |
| 40) | nitrogen monoxide | NO |

Naming Binary Compounds

Name: _____

Identify the type of binary compound and then write the correct name for the chemical formulas listed below.

- | | |
|-----------------------------------|------------------------------|
| 1. KF | potassium fluoride |
| 2. PbO ₂ | lead (IV) oxide |
| 3. MgF ₂ | magnesium fluoride |
| 4. S ₂ Cl ₂ | disulfur dichloride |
| 5. N ₂ O ₃ | dinitrogen trioxide |
| 6. FeF ₃ | iron (III) fluoride |
| 7. SnF ₄ | tin (IV) fluoride |
| 8. K ₂ O | potassium oxide |
| 9. CCl ₄ | carbon tetrachloride |
| 10. Hg ₂ O | mercury (I) oxide |
| 11. MgO | magnesium oxide |
| 12. CO | carbon monoxide |
| 13. H ₂ O | dihydrogen monoxide, water |
| 14. FeO | iron (II) oxide |
| 15. NaCl | sodium chloride |
| 16. SO ₃ | sulfur trioxide |
| 17. BaO | barium oxide |
| 18. NH ₃ | nitrogen trihydride, ammonia |
| 19. CO ₂ | carbon dioxide |
| 20. NO | nitrogen monoxide |

Naming Binary Compounds

Name: _____

Identify the type of binary compound and then write the correct chemical formula for the compound named in each of the following examples.

- | | |
|----------------------------|-------------------------|
| 1. dinitrogen pentoxide | N_2O_5 |
| 2. iron (III) chloride | FeI_3 |
| 3. barium sulfide | BaS |
| 4. carbon monoxide | CO |
| 5. carbon tetrachloride | CCl_4 |
| 6. tin (IV) oxide | SnO_2 |
| 7. aluminum phosphide | AlP |
| 8. lead (II) nitride | Pb_3N_2 |
| 9. sodium iodide | NaI |
| 10. lithium chloride | LiCl |
| 11. xenon tetrafluoride | XeF_4 |
| 12. potassium sulfide | K_2S |
| 13. mercury (II) phosphide | Hg_3P_2 |
| 14. gallium hydride | GaH_3 |
| 15. copper (I) oxide | Cu_2O |
| 16. silicon dioxide | SiO_2 |
| 17. cobalt (III) phosphide | CoP |
| 18. silver chloride | AgCl |
| 19. aluminum bromide | AlBr_3 |
| 20. selenium hexafluoride | SeF_6 |

Naming Mixed Ionic and Covalent - Answers

Name the following compounds. Remember, they may be either ionic or covalent compounds, so make sure you use the right naming method!

- 1) NaF **sodium fluoride**
- 2) NF₃ **nitrogen trifluoride**
- 3) Li₂O **lithium oxide**
- 4) Al₂S₃ **aluminum sulfide**
- 5) MgSO₄ **magnesium sulfate**
- 6) SiH₄ **silicon tetrahydride**
- 7) KNO₃ **potassium nitrate**
- 8) P₂O₅ **diphosphorus pentoxide**
- 9) CH₄ **methane**
- 10) Ca(OH)₂ **calcium hydroxide**

Write the formulas for the following compounds. Remember, they may be either ionic or covalent compounds, so make sure you use the right method!

- 11) lithium chloride **LiCl**
- 12) nitrogen trichloride **NCl₃**
- 13) sodium oxide **Na₂O**
- 14) dinitrogen trioxide **N₂O₃**
- 15) ammonia **NH₃**
- 16) diboron dihydride **B₂H₂**
- 17) potassium phosphide **K₃P**
- 18) oxygen difluoride **OF₂**
- 19) magnesium nitrate **Mg(NO₃)₂**
- 20) aluminum carbonate **Al₂(CO₃)₃**

Counting Atoms Sheet - Answers

Name each of the following chemical compounds .

- | | | |
|----|------------------------------|----------------------------|
| 1) | CaF_2 | calcium fluoride |
| 2) | $\text{Be}(\text{OH})_2$ | beryllium hydroxide |
| 3) | NO_2 | nitrogen dioxide |
| 4) | $\text{Al}_2(\text{SO}_4)_3$ | aluminum sulfate |
| 5) | NH_4NO_3 | ammonium nitrate |
| 6) | S_2F_2 | disulfur difluoride |
| 7) | Na_2CO_3 | sodium carbonate |
| 8) | CH_4 | carbon tetrahydride |

Write the formulas for each of the following chemical compounds.

- | | | |
|-----|---------------------------|--|
| 9) | phosphorus trichloride | PCl_3 |
| 10) | magnesium hydroxide | $\text{Mg}(\text{OH})_2$ |
| 11) | potassium phosphate | K_3PO_4 |
| 12) | diphosphorus tetrabromide | P_2Br_4 |
| 13) | ammonia | NH_3 |
| 14) | germanium phosphate | $\text{Ge}_3(\text{PO}_4)_4$ |
| 15) | ammonium sulfate | $(\text{NH}_4)_2\text{SO}_4$ |
| 16) | diphosphorus pentoxide | P_2O_5 |

Answers – Naming Chemical Compounds

Name the following chemical compounds:

- | | | |
|-----|--|-------------------------------|
| 1) | NaBr | sodium bromide |
| 2) | Ca(C ₂ H ₃ O ₂) ₂ | calcium acetate |
| 3) | P ₂ O ₅ | diphosphorus pentoxide |
| 4) | Ti(SO ₄) ₂ | titanium(IV) sulfate |
| 5) | FePO ₄ | iron(III) phosphate |
| 6) | K ₃ N | potassium nitride |
| 7) | SO ₂ | sulfur dioxide |
| 8) | CuOH | copper(I) hydroxide |
| 9) | Zn(NO ₂) ₂ | zinc nitrite |
| 10) | V ₂ S ₃ | vanadium(III) sulfide |

Write the formulas for the following chemical compounds:

- | | | |
|-----|--------------------------------|---|
| 11) | silicon dioxide | SiO₂ |
| 12) | nickel (III) sulfide | Ni₂S₃ |
| 13) | manganese (II) phosphate | Mn₃(PO₄)₂ |
| 14) | silver acetate | AgC₂H₃O₂ |
| 15) | diboron tetrabromide | B₂Br₄ |
| 16) | magnesium sulfate heptahydrate | MgSO₄ · 7H₂O |
| 17) | potassium carbonate | K₂CO₃ |
| 18) | ammonium oxide | (NH₄)₂O |
| 19) | tin (IV) selenide | SnSe₂ |
| 20) | carbon tetrachloride | CCl₄ |

More Mixed Naming Fun! - Answers

Name these compounds. They may be either ionic or covalent.

- 1) LiOH **lithium hydroxide**
- 2) PBr_3 **phosphorus tribromide**
- 3) Na_2SO_4 **sodium sulfate**
- 4) $(\text{NH}_4)_2\text{S}$ **ammonium sulfide**
- 5) CaCO_3 **calcium carbonate**
- 6) CF_4 **carbon tetrafluoride**
- 7) NaNO_3 **sodium nitrate**
- 8) P_2S_3 **diphosphorus trisulfide**
- 9) $\text{Al}(\text{NO}_3)_3$ **aluminum nitrate**
- 10) $\text{Mg}(\text{OH})_2$ **magnesium hydroxide**

Write the formulas for the following compounds. Remember, they may be either ionic or covalent compounds, so make sure you use the right method!

- 11) potassium oxide **K_2O**
- 12) phosphorus tribromide **PBr_3**
- 13) calcium hydroxide **$\text{Ca}(\text{OH})_2$**
- 14) dinitrogen sulfide **N_2S**
- 15) carbon monoxide **CO**
- 16) diboron tetrahydride **B_2H_4**
- 17) phosphorus pentabromide **PBr_5**
- 18) sulfur dichloride **SCl_2**
- 19) sodium carbonate **Na_2CO_3**
- 20) aluminum acetate **$\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3$**

Hydrates Homework Sheet

1) What is a hydrate?

A HYDRATE IS AN IONIC COMPOUND THAT HAS WATER TRAPPED INSIDE THE STRUCTURE OF THE COMPOUND. THIS WATER IS PHYSICALLY TRAPPED NOT CHEMICALLY BONDED.

2) Define the following terms as they relate to hydrates:

❖ Anhydrate : A HYDRATE THAT HAS HAD ALL WATER REMOVED.

❖ Dehydration: THE PROCESS OF REMOVING WATER USING HEAT.

3) Write the compound name for the following formulas:

- | | |
|---|---------------------------------------|
| a) $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ | <u>sodium sulfate decahydrate</u> |
| b) $\text{LiNO}_3 \cdot 3\text{H}_2\text{O}$ | <u>lithium nitrate trihydrate</u> |
| c) $\text{Cu}_2\text{SO}_3 \cdot 3\text{H}_2\text{O}$ | <u>copper (I) sulfite trihydrate</u> |
| d) $\text{Ca}(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$ | <u>calcium nitrate dihydrate</u> |
| e) $\text{NaClO}_4 \cdot \text{H}_2\text{O}$ | <u>sodium perchlorate monohydrate</u> |

4) Write the formulas for the following compounds:

- | | |
|--------------------------------------|---|
| a) zinc sulphate heptahydrate | $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ |
| b) copper (I) sulphite monohydrate | $\text{Cu}_2\text{SO}_3 \cdot 1\text{H}_2\text{O}$ |
| c) cobalt (II) fluoride tetrahydrate | $\text{CoF}_2 \cdot 4\text{H}_2\text{O}$ |
| d) lithium nitrate trihydrate | $\text{LiNO}_3 \cdot 3\text{H}_2\text{O}$ |
| e) sodium sulphate decahydrate | $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ |

Write the correct formula for the named compound.

- | | |
|--------------------------------------|--|
| 1. zinc sulphate heptahydrate | $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ |
| 2. copper (I) sulphite monohydrate | $\text{Cu}_2\text{SO}_3 \cdot 1\text{H}_2\text{O}$ |
| 3. cobalt (II) fluoride tetrahydrate | $\text{CoF}_2 \cdot 4\text{H}_2\text{O}$ |
| 4. lithium nitrate trihydrate | $\text{LiNO}_3 \cdot 3\text{H}_2\text{O}$ |
| 5. sodium sulphate decahydrate | $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ |
| 6. calcium nitrate trihydrate | $\text{Ca}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ |
| 7. calcium sulphate hexahydrate | $\text{CaSO}_4 \cdot 6\text{H}_2\text{O}$ |
| 8. sodium phosphate tetrahydrate | $\text{Na}_3\text{PO}_4 \cdot 4\text{H}_2\text{O}$ |
| 9. aluminum hypochlorite octahydrate | $\text{Al}(\text{ClO})_3 \cdot 8\text{H}_2\text{O}$ |
| 10. cesium carbonate dihydrate | $\text{Cs}_2\text{CO}_3 \cdot 2\text{H}_2\text{O}$ |

Write the correct name for the formula shown.

- | | |
|--|---------------------------------|
| 1. $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ | sodium sulfate decahydrate |
| 2. $\text{LiNO}_3 \cdot 3\text{H}_2\text{O}$ | lithium nitrate trihydrate |
| 3. $\text{Cu}_2\text{SO}_3 \cdot 3\text{H}_2\text{O}$ | copper (I) sulfite trihydrate |
| 4. $\text{Ca}(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$ | calcium nitrate dihydrate |
| 5. $\text{NaClO}_4 \cdot \text{H}_2\text{O}$ | sodium perchlorate monohydrate |
| 6. $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ | magnesium sulfate heptahydrate |
| 7. $\text{Cs}_2\text{CO}_3 \cdot 2\text{H}_2\text{O}$ | cesium carbonate dihydrate |
| 8. $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ | zinc sulfate heptahydrate |
| 9. $\text{Na}_3\text{PO}_3 \cdot 4\text{H}_2\text{O}$ | sodium phosphite tetrahydrate |
| 10. $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ | nickel (II) nitrate hexahydrate |