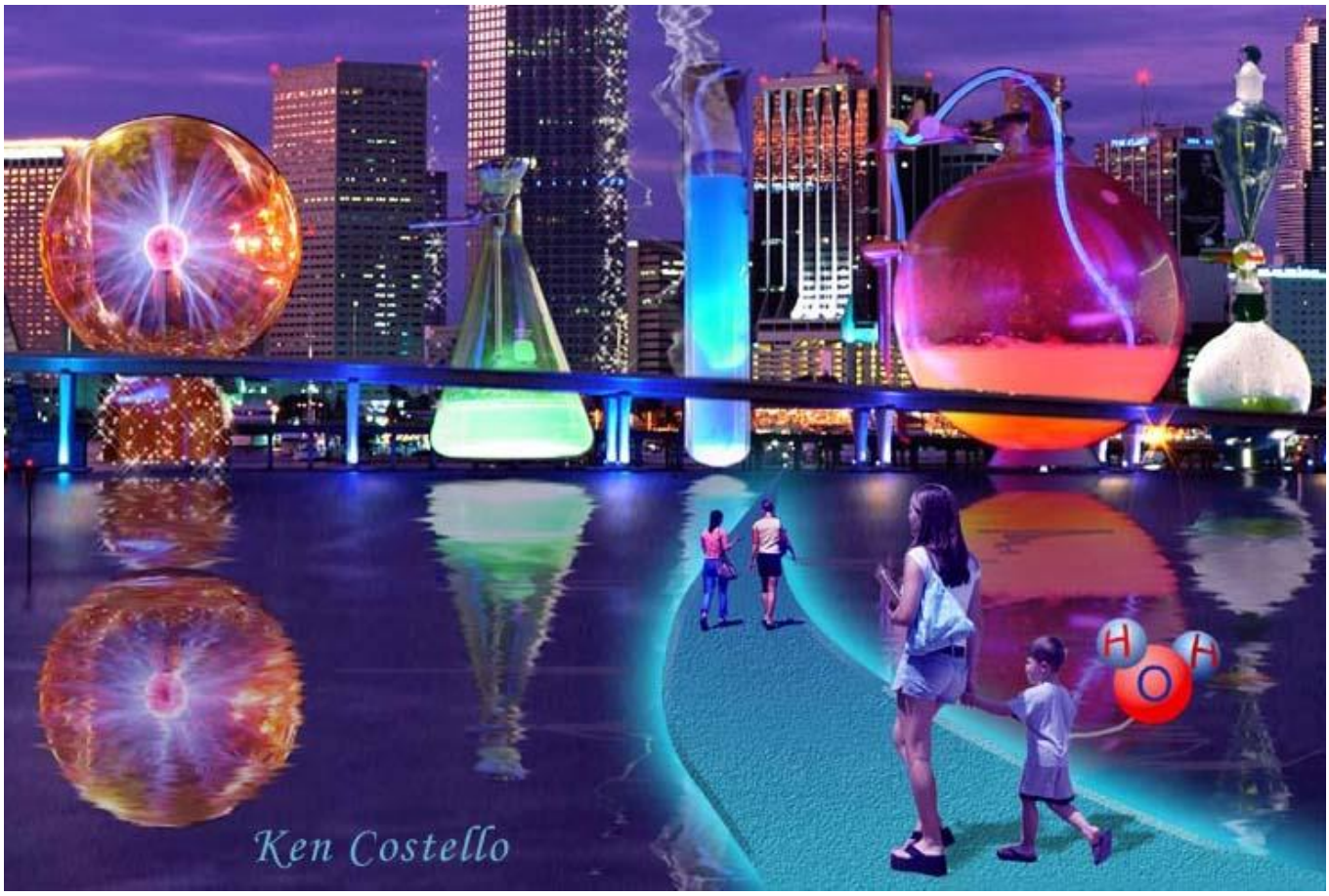
CHEMISTRY WORKBOOK A

WRITING FORMULAE AND NAMES OF IONIC SUBSTANCES
AND
BALANCING EQUATIONS



NAME: _____

WRITING FORMULAE

Write the formulas for the following chemical compounds:

1) sodium bromide _____

2) calcium acetate _____

3) lithium carbonate _____

4) Tin (IV) sulfate _____

5) iron (III) phosphate _____

6) potassium nitride _____

7) acetic acid (hydrogen acetate) _____

8) strontium chloride _____

9) zinc nitride _____

10) vanadium (III) sulfide _____

11) molybdenum (II) sulfate _____

12) nickel (III) sulfide _____

13) manganese (II) phosphate _____

14) silver acetate _____

15) cobalt (III) oxide _____

16) magnesium sulfate _____

17) potassium carbonate _____

18) ammonium oxide _____

19) tin (IV) hydroxide _____

20) hydroiodic acid (hydrogen iodide) _____

Lots of Ionic Naming Practice Problems

Name the following ionic compounds:

1) $NaBr$ _____

2) $Ca(OH)_2$ _____

3) $Fe_2(SO_4)_3$ _____

4) NH_4F _____

5) $CaCO_3$ _____

6) $NiPO_4$ _____

7) Li_2SO_4 _____

8) Zn_3P_2 _____

9) $Sr(CH_3COO)_2$ _____

10) CuI _____

11) Ag_3PO_4 _____

12) $FeCl_3$ _____

13) CuS _____

14) Ag_2SO_4_____

15) KNO_3 _____

16) Pb_3N_2 _____

17) $CuCO_3$ _____

18) $MgSO_4$ _____

19) $Cu(NO_3)_2$ _____

20) $Fe(HCO_3)_2$ _____

Write the formulas for the following ionic compounds:

21) lithium acetate _____

22) iron (II) phosphate _____

23) calcium bromide _____

25) sodium hydroxide _____

27) beryllium hydroxide _____

28) zinc carbonate _____

29) manganese (VII) chloride _____

30) copper (II) acetate _____

31) cobalt (III) bromide _____

32) ammonium oxide _____

33) potassium hydroxide _____

34) lead (IV) sulfate _____

35) silver phosphate _____

36) vanadium (V) nitride _____

37) strontium acetate _____

38) barium sulfate _____

39) iron (II) sulfide _____

40) ammonium sulfate _____

Balanced Chemical Equations

Calculate how many atoms of each element are present on the reactant side of each equation. Also write word equations for the equations below (except questions 2,7,8,9,11,14,15):

1) **1** N_2 + **3** H_2 → **2** NH_3

2) **2** $KClO_3$ → **2** KCl + **3** O_2

3) **2** NaCl + **1** F_2 → **2** NaF + **1** Cl_2

4) **2** H_2 + **1** O_2 → **2** H_2O

5) **1** $Pb(OH)_2$ + **2** HCl → **2** H_2O + **1** $PbCl_2$

6) **2** $AlBr_3$ + **3** K_2SO_4 → **6** KBr + **1** $Al_2(SO_4)_3$

7) **1** CH_4 + **2** O_2 → **1** CO_2 + **2** H_2O

8) **1** C_3H_8 + **5** O_2 → **3** CO_2 + **4** H_2O

9) **2** C_8H_{18} + **25** O_2 → **16** CO_2 + **18** H_2O

10) **1** $FeCl_3$ + **3** $NaOH$ → **1** $Fe(OH)_3$ + **3** $NaCl$

11) **4** P + **5** O_2 → **2** P_2O_5

12) **2** Na + **2** H_2O → **2** $NaOH$ + **1** H_2

13) **2** Ag_2O → **4** Ag + **1** O_2

14) **1** S_8 + **12** O_2 → **8** SO_3

15) **6** CO_2 + **6** H_2O → **1** $C_6H_{12}O_6$ + **6** O_2

READING INFORMATION

1. When sulphur trioxide gas (SO_3), which is present in smoggy air in trace concentrations, reacts with water from rain, sulphuric acid (hydrogen sulfate), a very corrosive acid, forms as the only product. Write a NON-BALANCED equation showing the formulae of reactants and product.

2. Write the balanced equation that expresses in acceptable chemical shorthand the information given in the statement, "Iron metal can be made to react with molecular oxygen to give iron oxide having the formula Fe_2O_3."

3. Balance the following equations:

   (a) $SO_2 + O_2 \text{ ---> } SO_3$

   (b) $Mg + O_2 \text{ ----> } MgO$

   (c) $NO + O_2 \text{ ----> } NO_2$

   (d) $HgO \text{ ----> } Hg + O_2$

   (e) $N_2 + H_2 \text{ ----> } NH_3$

   (f) $P + O_2 \text{ ----> } P_4O_{10}$

   (g) $KClO_4 \text{ -----> } KCl + O_2$

   (h) $PbO_2 \text{ ----> } PbO + O_2$

4. Write the balanced equation for the formation of table salt, NaCl (sodium chloride), from sodium metal, and gaseous chlorine.

5. **Although bright and shiny, aluminum objects are covered with a tight, invisible coating of aluminum oxide, (Al_2O_3) that forms when freshly exposed aluminum (Al) reacts with oxygen. Write the balanced equation for this reaction.**

6. **Balance these equations.**

   a) $Sn(s) + O_2(g) \longrightarrow SnO(s)$

   b) $Ca(s) + Br_2(g) \longrightarrow CaBr_2(s)$

   c) $P_4(s) + Cl_2(g) \longrightarrow PCl_5(g)$

   d) $C(s) + O_2(g) \longrightarrow CO_2(g)$

7. **Balance the following equations.**

   a) $Zn + S \longrightarrow ZnS$

   b) $H_2 + P \longrightarrow PH_3$

   c) $As + O_2 \longrightarrow As_2O_3$

   d) $H_2 + S \longrightarrow H_2S$

   e) $Na + O_2 \longrightarrow Na_2O$

   f) $O_2 \longrightarrow O_3$

   g) $As + H_2 \longrightarrow AsH_3$

   h) $Sb + O_2 \longrightarrow Sb_2O_3$

Word Equations

Write the word equations for each of the following chemical reactions:

1) When dissolved beryllium chloride reacts with dissolved silver nitrate in water, aqueous beryllium nitrate and silver chloride powder are made.

2) When isopropanol (C_3H_8O) burns in oxygen, carbon dioxide, water, and heat are produced.

3) When dissolved sodium hydroxide reacts with sulfuric acid (H_2SO_4), aqueous sodium sulfate, water, and heat are formed.

4) When fluorine gas is put into contact with calcium metal at high temperatures, calcium fluoride powder is created in an exothermic reaction.

5) When sodium metal reacts with iron (II) chloride, iron metal and sodium chloride are formed.

6) When lithium hydroxide pellets are added to a solution of sulfuric acid, lithium sulfate and water are formed.

7) Lava in model volcanoes is usually made from the reaction of powdered sodium bicrobonate and vinegar (hydrogen acetate), which creates carbon dioxide gas and water.

8) If a copper coil is placed into a solution of silver nitrate, silver crystals form on the surface of the copper. Additionally, highly soluble copper (I) nitrate is generated.

9) When crystalline C_6H_{126} is burned in oxygen, carbon dioxide and water vapour are formed.

Balancing Equations Practice Worksheet

Balance the following equations:

1) ___ $NaNO_3$ + ___ PbO → ___ $Pb(NO_3)_2$ + ___ Na_2O

2) ___ AgI + ___ $Fe_2(CO_3)_3$ → ___ FeI_3 + ___ Ag_2CO_3

3) ___ $C_2H_4O_2$ + ___ O_2 → ___ CO_2 + ___ H_2O

4) ___ $ZnSO_4$ + ___ Li_2CO_3 → ___ $ZnCO_3$ + ___ Li_2SO_4

5) ___ V_2O_5 + ___ CaS → ___ CaO + ___ V_2S_5

6) ___ $Mn(NO_2)_2$ + ___ $BeCl_2$ → ___ $Be(NO_2)_2$ + ___ $MnCl_2$

7) ___ $AgBr$ + ___ $GaPO_4$ → ___ Ag_3PO_4 + ___ $GaBr_3$

8) ___ H_2SO_4 + ___ $B(OH)_3$ → __ $B_2(SO_4)_3$ + ___ H_2O

9) ___ S_8 + ___ O_2 → ___ SO_2

10) ___ Fe + ___ $AgNO_3$ → ___ $Fe(NO_3)_2$ + ___ Ag

11) _____ $NaBr$ + _____ H_3PO_4 → _____ Na_3PO_4 + _____ HBr

12) _____ $Ca(OH)_2$ + _____ $Al_2(SO_4)_3$ → _____ $CaSO_4$ + _____ $Al(OH)_3$

13) _____ Mg + _____ Fe_2O_3 → _____ Fe + _____ MgO

14) _____ C_2H_4 + _____ O_2 → _____ CO_2 + _____ H_2O

15) _____ $PbSO_4$ → _____ $PbSO_3$ + _____ O_2

16) _____ NH_3 + _____ I_2 → _____ N_2I_6 + _____ H_2

17) _____ H_2O + _____ SO_3 → _____ H_2SO_4

18) _____ H_2SO_4 + _____ NH_4OH → _____ H_2O + _____ $(NH_4)_2SO_4$