

Chemistry Chapter 7 Worksheet

Name: _____

Provide a short and specific definition in YOUR OWN WORDS. Do not use the definition from the book

It should be noted that the chemical formulas and chemical names may not really exist. These chemical formulas and chemical names were created so you could practice using the naming rules.

Additional Notes:

Monatomic Ion _____

Binary Compound _____

Nomenclature _____

Oxyion _____

Salt _____

Oxidation # _____

Oxidation state _____

Formula mass _____

% composition _____

Empirical formula _____

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365

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Section 7.1

1. What do you call the simplest ratio of a compounds cations and anions in an ionic bond?

2. How many of EACH atom are present in the following compounds?

Compound	# of 1 st element	# of 2 nd element	# of 3 rd element
NaF			
BeF ₂			
AlPO ₄			
H ₂ O			
Mg(ClO ₄) ₂			
Ca ₃ (PO ₃) ₂			

3. Give 4 examples of monoatomic ions (make sure to include their charge)

Example 1	Example 2	Example 3	Example 4

4. Write the ion names for the following

Ion	Name	Ion	Name
Ca ⁺²		N ⁻³	
F ⁻¹		P ⁻³	

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5. What is the difference between naming a transition metal cation and the other cations?

6. What is the overall charge on a compound? _____

7. Write the chemical formula for the following chemical names. (**Bolded are due**)

Chemical Name	Chemical Formula	Chemical Name	Chemical Formula
Sodium chloride		Aluminum sulfide	
Magnesium chloride		Lithium nitride	
Magnesium oxide		Potassium sulfide	
Sodium sulfide		Magnesium phosphide	
Calcium oxide		Beryllium sulfide	
Aluminum chloride		Calcium phosphide	
Beryllium oxide		Calcium nitride	
Magnesium nitride		Beryllium chloride	
Potassium oxide		Calcium sulfide	
Aluminum bromide		Potassium bromide	
Lithium oxide		Magnesium bromide	

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8. Write the chemical name for the following chemical formulas. (**Bolded are due**)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
K₂O		Li₃N	
MgO		AlCl₃	
BeF₂		KCl	
CaO		MgCl₂	
Mg₃P₂		LiF	
Al₂O₃		Ca₃P₂	
Mg₃P₂		K₃N	
Li₂O		MgS	
K₂S		AlP	
MgF₂		BeCl₂	
Li₂S		Mg₃P₂	
Be₃P₂		CaS	
KF		Mg₃P₂	

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9. Write the chemical formula for the following chemical names (**Bolded are due**).

Chemical Name	Chemical Formula	Chemical Name	Chemical Formula
Iron (III) chloride		Mercury (IV) sulfide	
Cobalt (I) chloride		Scandium (II) nitride	
Mercury (I) oxide		Silver (IV) sulfide	
Copper (IV) sulfide		Nickel (III) phosphide	
Silver (V) oxide		Lead (I) sulfide	
Chromium (III) chloride		Chromium (II) phosphide	
Scandium (IV) oxide		Nickel (IV) nitride	
Silver (III) nitride		Cobalt (III) chloride	
Lead (II) oxide		Copper (II) sulfide	
Tin (V) bromide		Vanadium (V) oxide	
Chromium (I) oxide		Zinc (II) bromide	

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10. Write the chemical name for the following chemical formulas. (**Bolded are due**)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
Ag₂O		Zn₃N	
AgO		FeCl₃	
AgF₂		CuCl₂	
Zn₂O		ScCl₂	
Fe₃P₂		CrF	
Pb₂O₃		Pb₃P	
Co₃P₂		V₃N	
Mn ₂ O		CuS	
V ₂ S		AuP	
SnF ₂		AgCl ₂	
Fe ₂ S		V ₃ P ₂	
Fe ₃ P ₂		CrS	
NiF		Mn ₃ P ₂	

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11. Write the chemical formula for the following chemical names (**Bolded are due**).

Chemical Name	Chemical Formula	Chemical Name	Chemical Formula
Iron (III) sulfate		Lithium sulfate	
Cobalt (I) hydroxide		Calcium perchlorate	
Mercury (I) chlorate		Silver (IV) chlorite	
Calcium chlorate		Ammonium oxide	
Aluminum bromate		Lithium chromate	
Magnesium acetate		Chromium (II) phosphite	
Scandium (IV) carbonate		Ammonium nitrate	
Silver (III) sulfite		Aluminum nitrate	
Sodium perchlorate		Copper (II) hydroxide	
Tin (V) arsenate		Lithium carbonate	
Aluminum permanganate		Zinc (II) bromite	

12. Name the following polyatomic ions

Chemical Formula	Polyatomic Ion Name	Chemical Formula	Polyatomic Ion Name
CO		CO ₃	
CO ₂		CO ₄	

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13. Write the chemical name for the following chemical formulas. (**Bolded are due**)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
LiOH		Mg(NO₃)₂	
Ca(OH)₂		AgOH	
MgCO₃		Ca₃(PO₃)₂	
Ag(OH)₂		Ca(OH)₂	
Pb₂SO₄		Co(NO₃)₂	
Sn(OH)₃		Pb(CO₃)₂	
Be(OH)₂		MgSO₄	
Mg(OH) ₂		(NH ₄)SO ₂	
Au(NO ₃) ₂		AuPO ₃	
SnOH		Hg(NO ₃) ₃	
(NH ₄) ₂ O		NH ₄ OH	
ZnMnO ₄		PbCO ₃	
Al(OH) ₃		VNO ₃	

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14. Complete the table (i.e. give the chemical name or the chemical formula, whichever is missing)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
CdSO ₂		KClO ₂	
	Potassium Nitrite		Ammonium Carbonate
	Lithium Nitrate	FeCl ₃	
Ba(NO ₄) ₂			Zinc (I) Bromide
	Mercury (II) Chloride	SnO ₂	
Na ₃ PO ₃		Zn(ClO ₃) ₂	
(NH ₄) ₂ S			Copper (I) Chloride
	Calcium Chlorite		Potassium Nitrite
CaF ₂		Fe(NO ₂) ₂	
	Magnesium Nitride		Silver (I) Sulfide
Ca ₃ (PO ₄) ₂		Al(C ₂ H ₃ O ₂) ₃	
	Aluminum Carbonate		Mercury (I) Oxide
Cu ₂ SO ₃			Iron (III) Hydroxide

STOP 1

Chemistry Chapter 7 Worksheet

15. Write the chemical formula for the following chemical names (**Bolded are due**).

Chemical Name	Chemical Formula	Chemical Name	Chemical Formula
Carbon dioxide		Heptanitrogen octobromide	
Nitrogen dioxide		hexaboron monosilicide	
Sulfur trioxide		Decacarbon trisulfide	
Carbon trifluoride		Heptacarbon hexoxide	
Nitrogen hexachloride		Dinitrogen heptaphosphide	
Tetracarbon tetroxide		hexaboron monosilicide	
Pentafluoride dioxide		Carbon monoxide	
iodine pentafluoride		Tetracarbon decoxide	
Trinitrogen hexabromide		Dinitrogen tetraoxide	
Tricarbon dioxide		Heptanitrogen trioxide	
phosphorus triiodide		Carbon disulfide	

Chemistry Chapter 7 Worksheet

16. Write the chemical name for the following chemical formulas. (**Bolded are due**)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
CO		NO	
N₂O		N₇S₃	
C₃S₅		C₅Cl₇	
N₂O₄		C₂Br₉	
C₆O₅		NCl₅	
N₂O₂		OF₃	
NS		S₂Cl₃	
CF₄		P₆O₂	
NF₄		CCl₄	
P₃S		P₅S₆	
NF₅		C₆O	
C₂F₈		C₂Cl₁₀	
C₄F₆		P₄O₉	

17. What are the Rules for naming acids?

18. Write the acid name for the following chemical formulas. (**Bolded are due**)

Chemical Formula	Acid Name	Chemical Formula	Acid Name
HC₂H₃O₂		HCl	
HClO		HBr	
HClO₂		H₃P	
HClO₃		HBrO₃	
HClO₄		H₂SO₃	
HNO₂		HMnO₄	
HF		HNO ₃	
H ₂ SO ₄		H ₃ PO ₃	
H ₃ PO ₂		H ₂ SO ₂	
HI		H ₂ CrO ₄	
H ₂ SO ₂		H ₃ PO ₄	

19. Write the chemical formula for the following chemical names (**Bolded are due**).

Acid Name	Chemical Formula	Acid Name	Chemical Formula
Hydrochloric acid		Chlorous acid	
Sulfuric acid		Hydroiodidic acid	
Sulfurous acid		Phosphoric acid	
Hydrosulfurous acid		Phosphorous acid	
Permanganic acid		Hydrobromic acid	
Chromic acid		Bromic acid	
Carbonic acid		Broumous acid	
Hydrosufuric acid		Hypobromous acid	
Carbonous acid		Chloric acid	
Acetic acid		Hydrofluoric acid	
Hydroacetic acid		Perchloric acid	

STOP 2

Chemistry Chapter 7 Worksheet

20. Complete the table (i.e. give the chemical name or the chemical formula, whichever is missing)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
CdSO ₂			Calcium nitride
	Potassium Nitrite	Fe ₃ (PO ₄) ₂	
	Calcium oxide		Mercury (VII) sulfate
	Carbon trifluoride	AlP	
	Zinc (II) bromide	SnO ₂	
Na ₃ PO ₃			Lithium nitride
SnF ₂		HF	
	Copper (IV) sulfide	MgSO ₄	
	Potassium bromide	NCl ₅	
	Magnesium Nitride		Silver (I) Sulfide
HBr			Tetracarbon decoxide
Mg ₃ P ₂			Mercury (I) Oxide
	Hypobromous acid	Be ₃ P ₂	

Chemistry Chapter 7 Worksheet

21. Complete the table (i.e. give the chemical name or the chemical formula, whichever is missing)

Chemical Formula	Chemical Name	Chemical Formula	Chemical Name
AuPO_3		S_2Cl_3	
CuCl_2			Calcium chlorate
	Zinc (II) bromite	C_2O	
	Tricarbon dioxide		Sodium perchlorate
$\text{Ag}(\text{OH})_2$		$\text{Sn}(\text{OH})_3$	
	Chromium (II) phosphite	V_3P_2	
	Ammonium oxide	LiOH	
Fe_3P_2		$(\text{NH}_4)_2\text{O}$	
N_2O_4			Sulfur trioxide
HClO_4		NF_5	
PbCO_3		AlCl_3	
Fe_3P_2		H_2SO_2	
	Iron (III) oxide	Zn_3N	

STOP 3

Chemistry Chapter 7 Worksheet

Section 7.2

22. Assign the oxidation number to the each atom in the following chemical formulas.

Chemical Formula	Element #1	Element #2	Element #3
HF	H: _____	F: _____	
H ₂ O	H: _____	O: _____	
CS ₂	C: _____	S: _____	
Tricky! → H ₂ CO ₃	H: _____	C: _____	O: _____
NO ₂ ⁻¹	N: _____	O: _____	
SO ₂	S: _____	O: _____	
P ₄ O ₁₀	P: _____	O: _____	
N ₂ O ₅	N: _____	O: _____	

23. Give the prefix and stock symbol name for the following.

Chemical Formula	Prefix Name	Stock Symbol Name
Cl ₄		
N ₂ O		
NO ₂		

Chemistry Chapter 7 Worksheet

Section 7.3

24. Calculate the molar mass for the following (**Bolded are due**).

Chemical Formula	Molar Mass	Chemical Formula	Molar Mass
AuPO₃		S₂Cl₃	
CuCl₂		(NH₄)₂O	
LiOH		Mg₃P₂	
H₂SO₂		Ca(NO₃)₂	
Ag(OH)₂		Sn(OH)₃	
Pb(CO₃)₂		HgPO₄	
FeO		Hg₃(PO₄)₂	
Fe ₃ P ₂		PbS	
N ₂ O ₄		CO ₂	
HClO ₄		NF ₅	
H ₂ O ₂		AlCl ₃	
Fe ₃ P ₂		Al(MnO ₄) ₃	
Ca ₃ AsO ₄		Zn ₃ N	

Chemistry Chapter 7 Worksheet

25. Calculate the number of **moles** present for each compound.

Compound	Math	Answer
150 g CO ₂		
525 g of Sn(OH) ₃		

26. Calculate the number of **grams** present for each compound.

Compound	Math	Answer
3.5 moles of CO ₂		
78 moles of Sn(OH) ₃		
5.28 x 10 ²⁵ molecules of H ₂ O		
3.5 x 10 ²⁴ particles of Na ₃ PO ₄		

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365

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27. Calculate the number of **particles** present for each compound.

Compound	Math	Answer
4.5 moles of CO_2		
22.25 moles of NaCl		
1000 g of $\text{Ca}(\text{NO}_3)_2$		
525 g of $\text{Sn}(\text{OH})_3$		

Chemistry Chapter 7 Worksheet

28. Write down the percent error equation.

29. Calculate the percent composition for each element in the following compounds (**Bolded are due**).

Chemical Formula	% Comp element 1	% Comp element 1	% Comp element 1
CO₂			
PbS			
Sn(OH)₃			
H₂SO₂			
Ag(OH)₂			
Ca(NO₃)₂			
Hg ₃ (PO ₄) ₂			
Ca ₃ AsO ₄			
HgPO ₄			
Al(MnO ₄) ₃			
H ₂ O ₂			
Fe ₃ P ₂			

Chemistry Chapter 7 Worksheet

30. Complete the table (i.e. give the chemical name or the chemical formula, whichever is missing)

Hydrate Formula	Hydrate Name
$\text{BeCl}_2 \cdot 3\text{H}_2\text{O}$	
$\text{FePO}_4 \cdot 4\text{H}_2\text{O}$	
	Potassium chloride dihydrate
	Calcium oxide decahydrate
$\text{SnClO}_4 \cdot 2\text{H}_2\text{O}$	
	Gold (II) permanganate heptahydrate
$\text{Pb}_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$	
	Cobalt (I) sulfide octahydrate

31. You take a 1.5 gram sample of hydrated magnesium sulfate "X"hydrate and heat it over a Bunsen burner. After the heating, the chemical has a weight of 0.737 grams. Determine the correct formula AND name for this compound.

Chemical Formula	Chemical Name
Work	

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32. You heat a 170 gram sample of lithium nitrate "X"hydrate and heat it over a Bunsen burner. The sample left behind has a weight of 95.3 grams. Determine the correct formula AND name for this compound.

Chemical Formula	Chemical Name
Work	

33. You heat a sample of barium bromide "X"hydrate and determine it released 10.8 grams of water. The sample left over after the heating has a mass of 89.2 grams. Determine the correct formula AND name for this compound.

Chemical Formula	Chemical Name
Work	

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Section 7.4

34. What is the difference between a chemical formula and an empirical formula?

35. Identify the empirical formulas (by circling them) if the following table.

H_2O	NaCl
BeCl_2	$\text{C}_6\text{H}_{12}\text{O}_6$
FePO_4	Fe_2O_4
$\text{Al}_2(\text{NO}_3)_3$	$\text{Ca}(\text{OH})_2$
H_2O_2	FePO_4
SnClO_4	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$

36. A compound is found to have the following percent composition: 31.6% oxygen and 68.4% chromium. Determine this compound's empirical formula.

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365

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37. You are told a compound has molar mass of 34.015 g/mol. After performing an experiment on the compound you determine it is 5.93% hydrogen and 94.07 % oxygen. Determine this compounds empirical formula AND the molecular formula.

Empirical Formula _____ Molecular Formula _____

38. Nicotine has a molar mass of 162.1 g/mol and is comprised of 8.7% hydrogen, 74% carbon, and 17.3% nitrogen. Determine the empirical AND molecular formulas for nicotine.

Empirical Formula _____ Molecular Formula _____