

Worksheet 1: Significant Figures

1. Determine the number of significant figures in each of the following.

- a) 0.1890
- b) 1.380
- c) 10
- d) 110.0
- e) 1.02×10^{-4}
- f) 0.00038

2. Round the following to the three significant figures

- a) 0.0019481
- b) 19.291
- c) 10.00
- d) 7102.1919
- e) 1.0481×10^3
- f) 1500

3. Use a calculator to answer the following. Then round to the appropriate number of sig figs.

- a) $18.1 + 0.991$
 - b) $10.2 - 1.43$
 - c) $1.99 + 19$
 - d) $9.19 - 0.002$
 - e) $(1.38 \times 10^4) - (1.01 \times 10^2)$
 - f) $0.10 + 2.189 + 9$
-

4. Complete the following calculations, then round your answer to the appropriate number of sig figs.

a) $18.0 + 192$

b) $852.52 - 1.09$

c) $19.2 + 18.257 - 1.58$

d) $847.0 + 1000$

e) $(1.05 \times 10^6) + (1.8 \times 10^2)$

f) $9.2 / 18.3$

g) 27.352×1.9

h) $20 / 8.64$

i) $190 \times 8.2 / 1.93$

j) $(1.82 \times 10^{-3}) / (6.72 \times 10^{-2})$

Worksheet 2: Unit Conversions

Complete the following unit conversions, paying attention to significant figures.

1. 12,000 mg to centigrams

2. 0.75 kg to grams

3. 29 km to centimeters

4. 801,000,000 mL to liters

5. 96.25 in to yards

6. 22.5 yards to feet

7. 22.4 L to mL

8. 345 m to centimeters

Worksheet 3: Elements and Ions

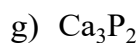
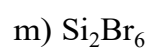
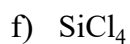
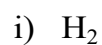
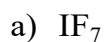
Use the name examples below to help you name the atoms and ions.

Use the information given on table below to calculate atomic mass. If not enough information is given on the table below then go to the periodic table to find the atomic mass. Round all atomic masses to the nearest whole number.

Nuclear Symbol	Atom/Ion name	Atom/Ion Symbol	Number of Protons	Number of Neutrons	Number of Electrons	Atomic Mass	Atomic Number
	Nitrogen	N					
		C ⁻⁴					
		Os					
	Barium Ion	Ba ⁺²					
		Pb ⁺⁴					
		Hf					
		I ⁻¹					
		Co					
		P ⁻³					
	Selenide Ion	Se ⁻²					

Worksheet 4: Binary Nomenclature

1. Write the correct name for the following



2. Write the correct formula for the following

a) Strontium nitride

g) Beryllium bromide

b) Tetraboron carbide

h) Oxygen difluoride

c) Dinitrogen pentoxide

i) Tetraiodine nonoxide

d) Nitrogen

j) Chlorine trifluoride

e) Potassium phosphide

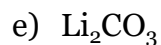
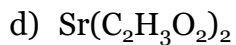
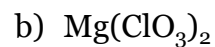
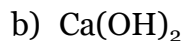
k) Xenon dibromide

f) Dicarbon hexachloride

l) Calcium sulfide

Worksheet 5: Polyatomic Nomenclature

1. Write the correct name for the following



2. Write the correct formula for the following

a) Magnesium phosphide

f) Cesium sulfate

b) Strontium nitrate

g) Aluminum fluoride

c) Potassium nitride

h) Ammonium hydroxide

d) Sodium phosphate

i) Barium acetate

e) Calcium chlorate

j) Potassium iodate

Worksheet 6: Transition Metal Nomenclature

1. Write the correct formula for the following

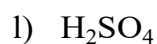
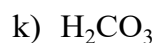
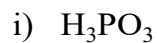
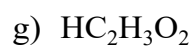
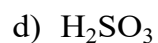
- | | |
|---------------------------|------------------------|
| a) Copper(I) chloride | f) Ferric oxide |
| b) Tin(IV) oxide | g) Iron(III) phosphate |
| c) Cupric nitrate | h) Lead(IV) iodide |
| d) Magnesium hypochlorite | i) Plumbous acetate |
| e) Stannous sulfide | j) Cuprous nitrate |

2. Write the correct name for the following

- | | |
|--------------------------------|--|
| a) FeCl_3 | f) $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$ |
| b) CuO | g) FeCO_3 |
| c) $\text{Sn}(\text{NO}_3)_4$ | h) SnSO_4 |
| d) $\text{Cu}(\text{ClO}_2)_2$ | i) N_2O_5 |
| e) KMnO_4 | j) PbS_2 |
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Worksheet 7: Acid Nomenclature

1. Write the correct name for the following



2. Write the correct formula for the following

a) Nitric acid

b) Chloric acid

c) Hydrochloric acid

d) Sulfurous acid

e) Chlorous acid

f) Hydrobromic acid

g) Phosphoric acid

h) Nitrous acid

i) Perchloric acid

j) Hydrofluoric acid

k) Perbromic acid

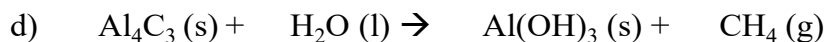
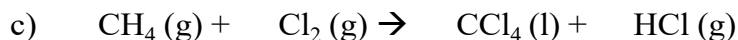
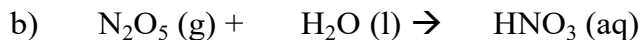
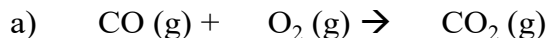
l) Sulfuric acid

m) Bromic acid

n) Hypoiodous acid

Worksheet 8: Equations

1. Balance the following equations.



2. Write a balanced equation for each of the following.

a) Iron metal reacts with oxygen to form rust, iron(III) oxide.

b) Calcium metal reacts with water to produce aqueous calcium hydroxide and hydrogen gas.

c) Aqueous barium hydroxide reacts with aqueous sulfuric acid to produce solid barium sulfate and water.

d) Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) reacts with oxygen gas to produce carbon dioxide and water vapor.

e) Solid iron(III) sulfide reacts with gaseous hydrogen chloride to form solid iron(III) chloride and hydrogen sulfide gas.

Worksheet 9 : Moles and Stoichiometry

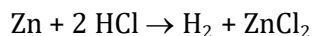
1. Vinegar is a dilute solution of acetic acid, CH_3COOH .

a. Calculate the molar mass of acetic acid.

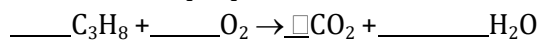
b. How many molecules of CH_3COOH are contained within 43.4 g of acetic acid?

c. How much would 0.450 moles of acetic acid weigh?

2. How many moles of hydrogen gas can be produced if 1.35 g of solid zinc reacts with excess hydrochloric acid according to the equation



3. The reaction for the combustion of propane is



a. If 20.0 g of C_3H_8 and 20.0 g of O_2 are reacted, how many moles of CO_2 can be produced?

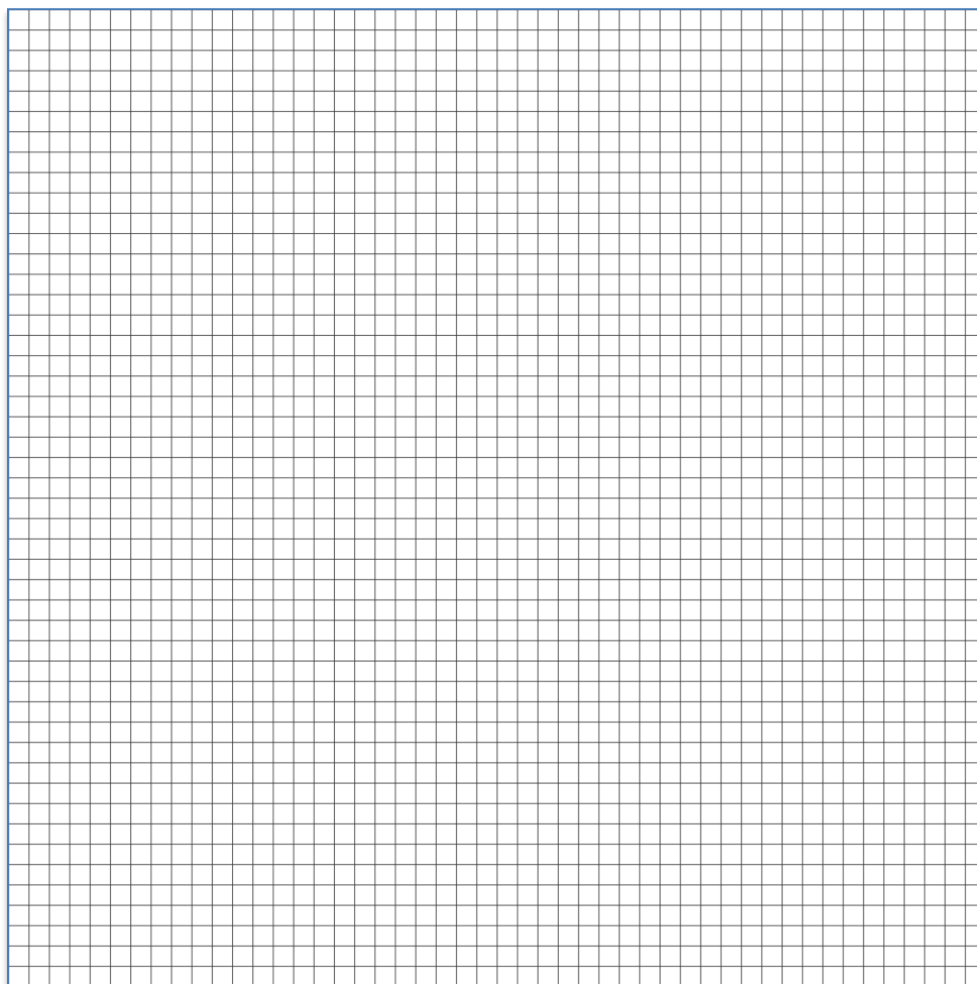
b. If 20.0 g of C_3H_8 and 80.0 g of O_2 are reacted, how many grams of CO_2 can be produced?

Worksheet 10: Graphing and Data Analysis

1. When anhydrous calcium chloride is dissolved in water, the temperature of the system changes. A student obtains the following data when dissolving increasing amounts of CaCl_2 into 100 mL of water:

Mass of CaCl_2 dissolved, g	0.91	2.94	5.92	8.81	10.89
ΔT, $^\circ\text{C}$	1.8	6.6	12.8	18.9	23.2

Plot the data on the graph below. Choose an appropriate scale, and label the axes appropriately.



Refer to the graph to answer the following questions.

Independent Variable:

Dependent Variable:

Provide a descriptive title for the graph:

2. Describe the relationship between grams of calcium chloride salt and change in temperature in a sentence.

2. Draw a line of best fit. Determine its slope, including units.

3. Predict the change in temperature when
 - a. 4.33 g of CaCl_2 are dissolved

 - b. 9.56 g of CaCl_2 are dissolved

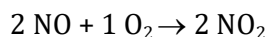
 - c. 15.4 g of CaCl_2 are dissolved

4. Predict what mass of CaCl_2 will result in
 - a. a 12.4°C change in temperature

 - b. a 44.9°C change in temperature

Worksheet 11: Particulate Drawings

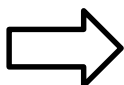
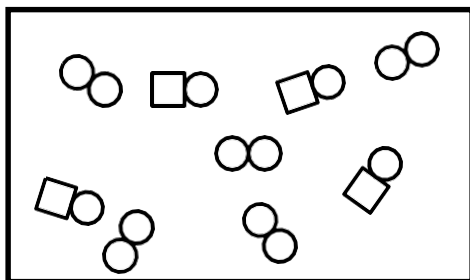
1. Consider the synthesis of nitrogen dioxide



- a. In the diagram below, nitrogen atoms are represented with squares and oxygen atoms are represented with circles. Using the conservation of matter, draw what you would expect to find in the reaction vessel once the reaction is complete.

Before Reaction:

After Reaction



Limiting Reactant:

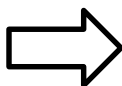
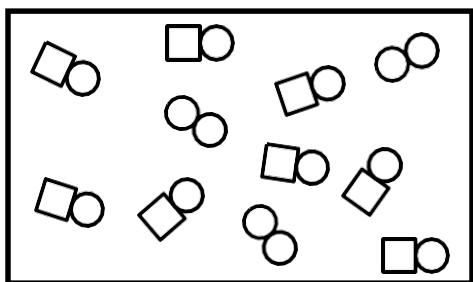
Excess Reactant:

Explanation

- b. Consider the same reaction, with different starting quantities. Draw the contents of the reaction vessel after the reaction is complete.

Before Reaction:

After Reaction



Limiting Reactant:

Excess Reactant:

Explanation