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A101

1. Determine the oxidation number for each element. Display each elements oxidation number above it as in the following S_2O_3 example.

+3 -2 ←final answers
S_2O_3
2(S) + 3(O)=0
2(S) + 3(-2)=0
S=+3
Show work like above.

NiI_2

Hg_2O

$Ca(ClO_2)_2$

Hg_2F_2

$FeSO_3$

$Mg(NO_3)_2$

$Fe_2(CrO_4)_3$

$BaCrO_4$

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A102

1. Write the formula for the compound names on the left and write the name for the formulas on the right.

Ammonium sulfide:_____

Sodium nitrate: _____

copper(I) bromide: _____

Aluminum sulfate: _____

Potassium nitrate: _____

iron(II) carbonate: _____

lead(II) phosphate: _____

tin(IV) sulfide: _____

NiI_2: _____

Hg_2O: _____

$Pb(ClO_2)_2$: _____

Hg_2F_2: _____

$FeSO_3$: _____

$Mg(NO_3)_2$: _____

$Fe_2(CrO_4)_3$: _____

$FeCrO_4$: _____

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A103

1. Calculate the formula mass for the following compounds. Show all your work. "I did it on the calculator" is not showing work.

a. CH_3COOH

Answer:_____

b. $AlPO_4$

Answer:_____

c. $CH_3CH_2CH_2CH_3$

Answer:_____

2. Determine the empirical formula using the following data.

Element	Quantity
C:	66.6%
H:	11.2%
O:	22.2%

Answer:_____

3. Determine the empirical formula using the following data.

Element	Quantity
Ru:	35.2%
N:	14.6%
O:	50.2%

Answer:_____

4. Calculate the percentage by mass for each element in $\mathbf{C_3H_6P}$.

Answer:_____

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A104

1. A compound is 24.7% Calcium, 1.2% Hydrogen, 14.8% Carbon, and 59.3% Oxygen. Write the empirical formula and name the compound.

2. A compound is 21.20% Nitrogen, 6.06% Hydrogen, 24.30% Sulfur, and 48.45% Oxygen. Write the empirical formula and name the compound.

3. A compound is 44.82% Potassium, 18.39% Sulfur, and 36.79% Oxygen. Write the empirical formula and name the compound.

4. A compound is 52.0% Zinc, 9.6% Carbon, and 38.4% Oxygen. Calculate the empirical formula of the compound.

5. A compound is 92.2% Carbon and 7.76% Hydrogen. The formula mass of the compound is 78.1 g. Calculate the empirical formula and molecular formula of the compound.

6. A compound is 43.7% Phosphorus and 56.3% Oxygen. The formula mass of the compound is 284 g. Calculate the empirical formula and molecular formula of the compound.

7. In an experiment, it was found that 11.775 g of Sn combined with 3.180 g of O. Write the empirical formula and name the compound that is formed.

8. A compound contains 21.6% Na, 33.3% Cl, and 45.1% O. Write the empirical formula and name the compound that is formed.

9. A compound is 19.3% Na, 26.9% S, and 53.8% O. Its formula mass is 238 g. What is its molecular formula?

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CA101 Finding Oxidation Numbers

1. Formula: Fe_2O_3
2(Fe) + 3(O)=0
2(Fe) + 3(-2)=0
Fe=+3
Show work like above.

6. Formula:_____

11. Formula:_____

2. Formula:_____

7. Formula:_____

12. Formula:_____

3. Formula:_____

8. Formula:_____

13. Formula:_____

4. Formula:_____

9. Formula:_____

14. Formula:_____

5. Formula:_____

10. Formula:_____

15. Formula:_____

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CA102 Writing Formulas for Ionic Compounds

1. Name:_____

Ions: ( )_( )_

Answer:_____

2. Name:_____

Ions: ( )_( )_

Answer:_____

3. Name:_____

Ions: ( )_( )_

Answer:_____

4. Name:_____

Ions: ( )_( )_

Answer:_____

5. Name:_____

Ions: ( )_( )_

Answer:_____

6. Name:_____

Ions: ( )_( )_

Answer:_____

7. Name:_____

Ions: ( )_( )_

Answer:_____

8. Name:_____

Ions: ( )_( )_

Answer:_____

9. Name:_____

Ions: ( )_( )_

Answer:_____

10. Name:_____

Ions: ( )_( )_

Answer:_____

11. Name:_____

Ions: ( )_( )_

Answer:_____

12. Name:_____

Ions: ( )_( )_

Answer:_____

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CA103 Naming Ionic Compounds Level 1 and 2

1. Formula:_____
Ions: ( )_( )_
Name:_____

2. Formula:_____
Ions: ( )_( )_
Name:_____

3. Formula:_____
Ions: ( )_( )_
Name:_____

4. Formula:_____
Ions: ( )_( )_
Name:_____

5. Formula:_____
Ions: ( )_( )_
Name:_____

6. Formula:_____
Ions: ( )_( )_
Name:_____

7. Formula:_____
Ions: ( )_( )_
Name:_____

8. Formula:_____
Ions: ( )_( )_
Name:_____

9. Formula:_____
Ions: ( )_( )_
Name:_____

10. Formula:_____
Ions: ( )_( )_
Name:_____

11. Formula:_____
Ions: ( )_( )_
Name:_____

12. Formula:_____
Ions: ( )_( )_
Name:_____

13. Formula:_____
Ions: ( )_( )_
Name:_____

14. Formula:_____
Ions: ( )_( )_
Name:_____

15. Formula:_____
Ions: ( )_( )_
Name:_____

16. Formula:_____
Ions: ( )_( )_
Name:_____

17. Formula:_____
Ions: ( )_( )_
Name:_____

18. Formula:_____
Ions: ( )_( )_
Name:_____

19. Formula:_____
Ions: ( )_( )_
Name:_____

20. Formula:_____
Ions: ( )_( )_
Name:_____

21. Formula:_____
Ions: ( )_( )_
Name:_____

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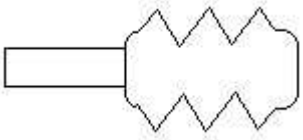
Lab101 Formula of Water

MATERIALS/CHEMICALS:

D.C. power supply
One 150-ml beaker
two electrode-tubes



60 ml of dilute sulfuric acid (1:60)

two electrodes 

PROCEDURE:

1. Put on your goggles
2. Remove all the air from two electrode-tubes by filling them with water. At this time, insert an electrode in each electrode-tube. Place the electrodes and electrode-tubes in a 150ml beaker and lift the whole assembly from the water. Drain as much water from the 150ml beaker as possible without losing the water from the electrode tubes.
3. Obtain 40 to 50ml sample of the dilute sulfuric acid an pour it into the beaker containing the electrodes and electrode-tubes.
4. Attach the alligator clips from the power supply to the electrode tubes.
5. Before turning on the power supply, check your setup with the teacher.

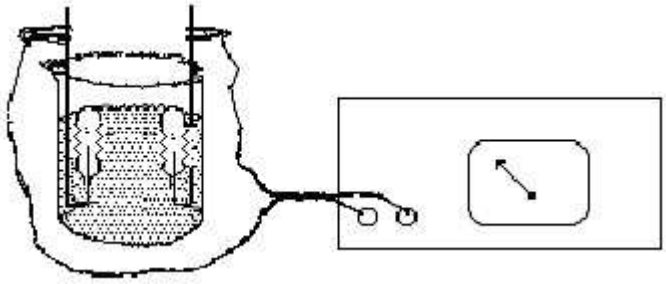


Figure 1-a

6. When you have confirmed the setup, turn on the power supply and observe the production of gasses in the electrode tubes.
7. What gasses are being produced in the tubes?_____
8. When the electrode-tube with the most gas is 2/3 full, switch the alligator clips and finish filling the tubes.
   Observations_____
   _____
9. What is the identity of the gas with greater volume? _____
10. Without losing the gas from tubes ***transport them to the spark device***. Place a tube over the park device and set of a spark.

QUESTIONS:

1. What is the ratio of volumes for the gases collected?

2. What is the formula for water?

3. Does the result of your work confirm the ratio of elements in water's formula?

4. Explain how it does so.

5. What mixture of hydrogen to oxygen should give off the best reaction using the spark device?

6. Why was the sulfuric acid solution used in this demonstration?

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Lab102 Grams to Moles

1. Pick out four samples.
2. Determine the number of **moles** and **atoms** for each sample.
3. Place your data in a data table.
4. Write a paragraph describing how to determine the moles for any sample.

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Lab103 % Water in a Hydrate

PERCENT WATER IN A HYDRATE

Purpose: To obtain a specific quantity of a hydrate, drive the water out by heating, and determine the percent water in the original sample.

Discussion: Some chemical compounds that appear to be dry solids actually contain water bound to the ions. These compounds are called hydrates. The amount of water in a specific hydrate is a fixed amount characteristic of that hydrate. Therefore the percent water in a hydrate can be used to help identify the hydrate.

The compound that remains after the water is driven out is called an anhydrous salt. The chemical formula of a hydrate is written with a raised dot (or asterisk) between the formula of the anhydrous salt and the formula for water.

In this lab you will work with the hydrate copper(II) sulfate. The formula is: $CuSO_4*5H_2O$. The raised dot does not mean multiplication. Many hydrates can be heated to drive out the water without decomposing the anhydrous salt. Your experience with percent problems suggests the kind of data needed for this lab. You need to determine the mass of hydrate and the mass of water removed. Since the water is impossible to trap and measure directly, the mass of the anhydrous salt will be measured after heating.

Procedure:

Put on your goggles and obtain the mass of a dry evaporating dish.

Add about 2 grams of the copper(II) sulfate pentahydrate . Weigh and record the exact mass.

Record the appearance of the hydrate:_____

Place the evaporating dish on triangle pipe stem on a ring stand.

Gently heat with a low flame. Do not allow any popping or spattering of the hydrate.

Record the appearance of the anhydrous salt:_____

When all of the hydrate has changed color, stop heating, remove with crucible tongs and set on the bottom of the ring stand to allow the evaporating dish to cool.

When cool, weigh and record the mass of the anhydrous salt. Never weigh hot items on any type of balance.

Reheat the evaporating dish to insure that all the water has been removed. Heat for about 1 minute. Cool, remove as before, and reweigh.

Mass of evaporating dish	g
Mass of evaporating dish and copper(II) sulfate pentahydrate	g
Mass of evaporating dish and anhydrous salt (1^{st} heating)	g
Mass of evaporating dish and anhydrous salt (2^{nd} heating)	g

Calculations: (Show Your Calculations)

Calculate the mass of copper(II) sulfate pentahydrate used.

Calculate the mass of anhydrous salt produced.

Calculate the mass of water released.

Calculate the percent water in the copper(II) sulfate pentahydrate.

Post-lab Questions:

The actual value for the percent of water in copper(II) sulfate is 36%. Calculate your percent error.

((A-E) /A)x100=%E

Suggest an error that would cause the percent of water in this experiment to be less than 36%. Explain your answer.

Suggest an error that would cause the percent of water in this experiment to be more than 36%. Explain your answer.