Unit 6
Class Work

NAME
1/20/14

6.2 Finding Molecular Formula and Percent Composition

SPARK

1. What is the grams formula mass of Na_2SO_4
2. What is the empirical formula of N_2O_4
3. A molecule has an empirical formula of CH_3. What is an example of a possible molecular formula?

Objective

SWBAT find the molecular formula of a compound and calculate the percent composition.

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6.2 Finding Molecular Formula and Percent Composition

SPARK

1. Grams formula mass of Na_2SO_4?

Objective

SWBAT find the molecular formula of a compound and calculate the percent composition.

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6.2 Finding Molecular Formula and Percent Composition

SPARK

2. What is the empirical formula of N_2O_4

Objective

SWBAT find the molecular formula of a compound and calculate the percent composition.

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6.2 Finding Molecular Formula and Percent Composition

SPARK

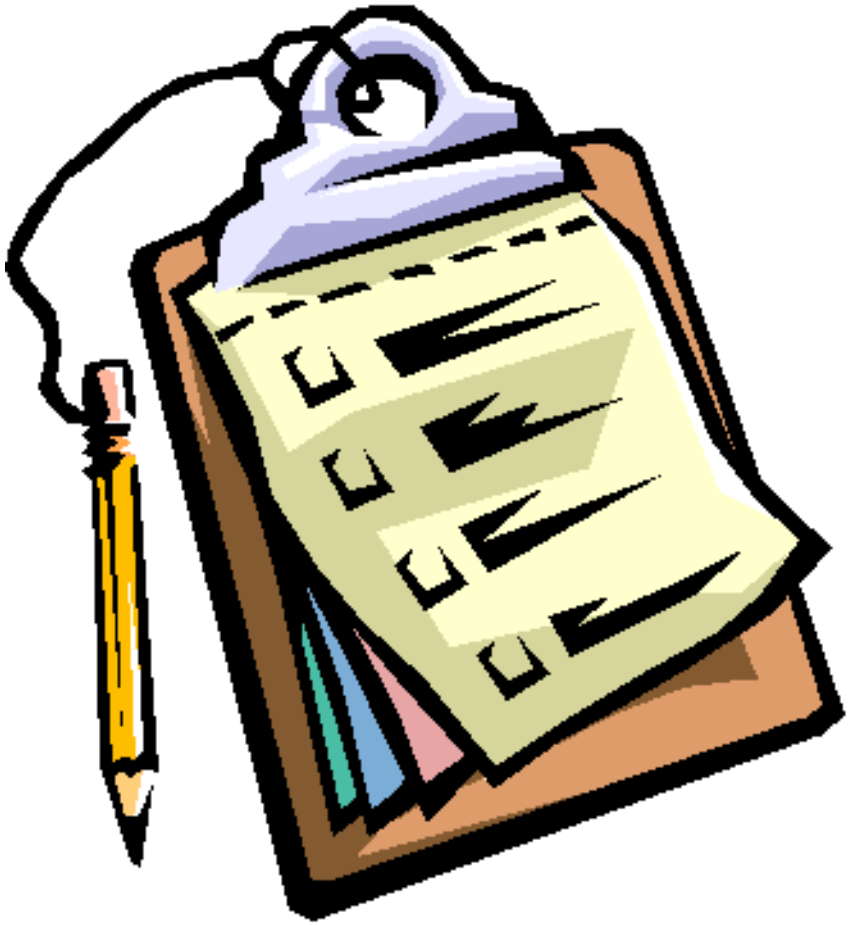
3. A molecule has an empirical formula of CH_3. What is an example of a possible molecular formula?

Objective

SWBAT find the molecular formula of a compound and calculate the percent composition.

Agenda:

- SPARK/Objective
- Announcements
- Notes
- Practice
- Exit Ticket
- Homework



Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Logistics

- Cations: Your midterm exam will be periods 2-3 on FRIDAY, January 24th (one week from today)
- Midterm is a Regents exam with half of the questions cut out
- Today I will pass back your Unit 1 and 2 materials from my filing cabinet as well as Winter Break work
- These materials must come back, organized to the filling cabinet on the day of the exam. This will be worth 5% of your midterm average!

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Grit to Greatness Award Presentation

- What is grit?
- Why is it important to have grit in this chemistry classroom?
- Why is it important to have grit in life?
- G2G shout outs!
- Grit to Greatness Award Certificate goes to…

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Answers from 6.1

1. (1)
2. (3)
3. (4)
4. (4)
5. (1)
6. (4)
7. (4)
8. (3)
9. (3)
10. (4)
11. (4)
12. (1)
13. (3)
14. (3)

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Review

- What type of chemical formula is the one with the simplest whole number ratios?
- What type of chemical is the actual ratio in which atoms are combined?

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Think about it!

A student was trying to find the gram-formula mass of $Mg(OH)_2$. They got 41 g.

- What did that student do wrong? What is the correct answer?

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

What is the grams formula mass important? What if we want to find the molecular formula?

Key IDEA:

- We can find the molecular formula from the empirical formula and the grams formula mass

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Step-by-Step – Step 1

- **Example 1:** A compound has a molecular mass of 180 g and an empirical formula of CH_2O. What is its molecular formula?

Step 1: Determine the mass of the empirical formula.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Step-by-Step – Step 2

- **Example 1:** A compound has a molecular mass of 180 g and an empirical formula of CH_2O. What is its molecular formula?

Step 2: Divide the formula of the compound by the mass of the empirical formula.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Step-by-Step – Step 3

- **Example 1:** A compound has a molecular mass of 180 amu and an empirical formula of CH_2O. What is its molecular formula?

Step 3: Multiply the subscripts of the empirical formula by the answer you got in step 2.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Answer Time

- The molecular formula of the compound is:

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Example #2

- Example 2: What is the molecular formula of a compound that has a molecular mass of 70 amu and has an empirical formula of CH_2?

Step 1:

Step 2:

Step 3:

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Percent Composition

- Percent composition is the % mass of each element in a compound

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Break it Down

Example 1: What is the percent composition of K and O in the compound K_2O?

- Step 1: Find the grams formula mass of the compound

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Break it Down

Example 1: What is the percent composition of K and O in the compound K_2O?

- Step 2: Divide the total mass of each element by the molecular mass and then multiply by 100 to get percent composition.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Practice

- **Example 2:** What is the percent composition of oxygen in potassium chlorate ($KClO_3$)?
- **Step 1:** Find the gram formula mass of the compound ($KClO_3$)

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Practice

- **Example 2:** What is the percent composition of oxygen in potassium chlorate ($KClO_3$)?

Step 2: Find the percent composition of oxygen by **dividing the total mass of oxygen** by the **gram formula mass of the compound** and then **multiplying by 100**.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Your Turn

- **Example 3:** What is the percent composition of oxygen in glucose, $C_6H_{12}O_6$?

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Sample Regents Question

- Arsenic is often obtained by heating the ore arsenopyrite, FeAsS. The decomposition of FeAsS is represented by the balanced equation below.

$$FeAsS(s) + heat \rightarrow FeS(s) + As(g)$$

Calculate the percent composition by mass of arsenic in arsenopyrite. Your response must include *both* a correct numerical setup and the calculated result.

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Practice Time

- Complete your 6.2 practice sheet for the remainder of the period!

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

Exit Ticket

- Complete your 6.2 Exit Ticket!

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.

HOMEWORK

Finish the rest of your 6.2 WS

Quiz TUESDAY on Unit 6

Study for midterm by review old notes and going through old flash cards!

Objective: SWBAT find the molecular formula of a compound and calculate the percent composition.