

Balancing equation lab:

Name: _____

Purpose: To better understand how to balance chemical equations.

Part A:

Materials:

2 T margarine

20 marshmallows

3 cups Rice Krispies

scale

hot plate

spoon

pie pan

saucepan

foil for weighing materials

Procedure:

1. Weigh the foil pan.
Mass of empty pan=_____
2. Weigh all ingredients Remember not to place anything directly on the balance:
Mass of marshmallows=_____
Mass of margarine =_____
Mass of Rice Krispies=_____
3. Melt the margarine in pie pan.
4. Add the marshmallows and stir continuously until melted completely.
5. Add Rice Krispies and stir until well coated.
6. Weigh the pan + the treats. Total mass=_____
7. Let treats cool. Cut and enjoy.

Questions:

- a. Total grams of reactants=_____grams (add from ingredients list)
 - b. Total grams of products=_____grams (subtract saucepan weight from saucepan + ingredients).
- c. Are the two measurements above pretty close to being the same? If not why do you think this happened. What law discusses this?
- d. If you only had 70 grams of marshmallows would this limit how many cookies you could make (assume you want the same texture and taste as original recipe)? Why?

Part B:

Materials:

1 compound model kit

Procedure:

1. Listen to your teacher and do as directed.
2. Answer the questions below.

Analysis:

1. The colored pieces in your kit represent types of atoms. Why are you using these instead of actual individual atoms of these elements?
2. When CH_4 combines with oxygen gas in the air CO_2 and water are produced. Which of your models represent reactants and which represent products?
3. Taking into consideration the meaning of the arrow in a chemical reaction, which models should be to the left of the arrow and which should be to the right?
4. Using your models, the plus signs, and an arrow, make a model of the chemical equation for this reaction. Using the chemical formula for each of the substances, plus signs, and an arrow, write the chemical equation for this reaction.
5. As you learned from the prior activity, reactants are on the left side of a chemical reaction equation and products are on the right side. The products are the substances formed. Consider baking cookies- are the cookies a new substance formed? (The cookies we made did not undergo a chemical reaction because they contain no eggs and were not baked.)
6. Is this a chemical reaction?
7. Are there reactants and products involved when baking cookies? What are they?

8. Write a chemical equation for baking cookies as you did for the reaction in part A. Ingredients needed to make cookies: flour, sugar, eggs, oil, baking powder, vanilla.
9. Is this all the information you need to know in order to bake these cookies? What else might you need to know?
10. How would you rewrite this equation if your recipe made 4 dozen cookies and called for .72 L of flour, .06 L of sugar, .06 L of oil, 2 eggs, 15 mL of baking powder, and 30 mL of vanilla, baked at 375°C until done?
11. If you wanted to make 8 dozen cookies would that change how much of each ingredient you would need? Why?
12. Compare the reaction you wrote in number 10 above to the one you wrote in Part b. What information is missing from the chemical equation?
13. Though the ingredients are no longer the same once they have been changed into cookies, the matter that made up the ingredients still exists. The same atoms in the ingredients are the atoms in the cookies. They have changed to yield a new product. The same thing is true with any chemical reaction. The same kinds and numbers of atoms that made up the reactants are used to make the products. Look at the model of the chemical reaction you made. Does it have the same kinds and numbers of atoms on both sides of the yield arrow?
14. Rewrite the equation from part b so that there are the same number of each type of atom on both sides of the equation.
15. If you have the same number and types of atoms on both sides of your chemical equation how would the masses compare before and after the reaction occurs? Why?
16. What Law explains this?

