

Science 8
Reacting Iron with Sulfur

Name _____ Date _____ Period _____ Group _____ Score _____

Problem: How will the total mass of iron and sulfur compare, from before it is heated to after it is heated?

Hypothesis: _____

Variables: By the time you finish this experiment you will need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.
Independent Variables: _____

Dependent Variables: _____

Controlled Variables: _____

Materials: Small test tube, balance, scoop, massing dish, small containers of iron and sulfur, burner, test tube holder, small balloon, magnet

Procedures: If you have ever smelled rotten eggs, then you'll have some idea of how unpleasant sulfur can be in some situations. Since we'll be heating sulfur, along with iron, the resulting odors can be very offensive and with some individuals, irritating. To keep these odors from causing any problems, we're going to confine them in the test tube they're being heated in. To do this, you'll cover the end of the test tube with a small balloon, after you've added the iron and sulfur.

1. Determine the mass of your massing dish, and record it here. _____ g
2. Observe and record the odor, color and effect of a magnet on the iron and sulfur before heating. When testing for attraction to the magnet, touch the magnet to the **outside** of the **closed** containers of iron and sulfur. Record step 2 observations in the chart on the back.
3. You'll need to combine 1.6 g of sulfur with 2.8 g of iron. To do this accurately, add 1.6 g plus whatever the mass of the empty massing dish was. Set your balance to this new amount. Using the scoop, carefully add sulfur to the massing dish which should still be on the balance. When the pointer lines up with zero, you'll have a total of 1.6 g of sulfur in the dish. Add the sulfur to the test tube.
4. In the same way, add 2.8 g plus whatever the mass of the empty massing dish was. Set your balance to this new amount and add the iron until it balances. Put the iron into the test tube.
5. Cover the test tube with your finger and shake it until the iron and sulfur are evenly mixed.
6. Seal the end of the test tube with the small balloon. The balloon will remain on until you are done massing.
7. Measure and record the mass of the test tube and contents in the chart on back.
8. Hold the test tube with the tube holder at a 45° angle over the burner and heat until no more yellowish gas is seen swirling around the inside of the tube. Keep the balloon away from flame.
9. Only when the test tube has cooled, mass the test tube and contents again and record.
10. Calculate the percent change in mass as indicated in the chart.
11. Observe and record the odor (*remove balloon only after massing and let it air out before testing for odor*), color and effect of a magnet on the iron and sulfur now that it has reacted and record.

Safety: Safety goggles must be worn when using burner. Handle test tube only when cool.

	Iron	Sulfur	Iron+Sulfur (after heating)
Odor			
Color			
Reaction to Magnet			

1. Mass of test tube and contents before heating	_____g
2. Mass of test tube and contents after heating	_____g
3. Change in mass (#2 – #1)	_____g
4. Percent change in mass [(#2 – #1) ÷ #1] x 100 Round to 2 decimal places	_____%

1. Was the mass of iron and sulfur affected by heating? _____ Explain your answer. _____

2. What evidence do you have that the material after heating is no longer iron or sulfur, but something new ? Explain your answer. _____

Conclusion: Determine if your original hypothesis was correct or not using the best information collected during the experiment to support your answer. If your answer to the problem was incorrect, give the correct answer, again using the best information collected during the experiment to support your answer . Explain your reasoning by including a brief analysis of your data !

Sources of Error: In looking back at the lab you just completed, what were two things someone might have done that made their results less than a hundred percent reliable. They must be **new** and **unique** to this activity, and you must be **specific** about what the source of error is.