

Report for Experiment 35

Mass Relationships in Chemical Reactions

Prelaboratory Questions

1. Of the types of reactions discussed in class, which type would most likely begin with a single reactant and involve an apparent decrease in mass.
2. Why must you avoid using the stirring rod to break up the solid while it is in the filter?
3. Discuss the effects that might result from the following typical student technique errors. Specify whether the mass of the sample will appear to be greater or less than it should be.
 - a. The student forgets to find the mass of the empty beaker before beginning, and uses the mass of another beaker in the calculations.
 - b. The student finds the mass of the empty beaker, then adds a masking-tape label for ease of identification later.
 - c. The student uses a stirring rod to break up the product, then places the rod on the desk top between uses.
 - d. To save time, the student finds the mass of the filter and product immediately after filtration, rather than waiting for it to dry overnight.

Observation and Data

Item	Mass (g)
Mass of labeled beaker	
Mass of beaker and unknown sample	
Mass of beaker and sample after heating	
Mass of filter paper	
Mass of filter and dried product	

1. Describe the changes that occurred:
 - a. during heating of the blue solid
 - b. as the first few drops of water were added to the brown solid
 - c. when aluminum was added to the blue solution
2. Describe the appearance of the contents of the beaker at the start of Day 2.

Analysis and Conclusions

Show all work

1. Calculate the mass of the original sample, the mass lost during heating and the mass of solid remaining in the beaker. (show all calculations)

Mass of original sample	
Mass lost during heating	
Mass of solid after heating	

2. Calculate the mass of final product. (show all calculations)

Mass of final product	
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3. Calculate the ratio of the mass of final product to the mass of the original blue solid. (show all calculations)

$\frac{\text{Mass of final product}}{\text{Mass of original product}}$	
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4. Calculate the ratio of the mass of final product to the mass of the solid remaining after heating. (show all calculations)

$\frac{\text{Mass of final product}}{\text{Mass of solid after heat}}$	
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5. Given what you observed when you added distilled water in step 4, suggest a reasonable explanation for the mass loss during heating.

6. What might have happened if you had left the beaker and contents from step 3 overnight before finding the mass?

- 7a. Cite at least three examples of evidence for chemical change that you observed in step 5.

- 1.

- 2.

3.

7b. Of the categories of reactions discussed in your text, which type was involved in step 5 of the procedure?

7c. How do you know?

8a. Does your final product appear to be the same substance as either of the other solids in this experiment? (Don't include aluminum in your consideration.)

8b. Explain.

9a. Compare your ratios from calculations 3 and 4 to those of other teams. Are the results consistent or do they appear to vary in random fashion?

9b. Does this experiment illustrate the Law of Constant Composition?

9c. Explain.

10a. Did the heating of the original blue solid result in a chemical change or a physical change?

10b. Explain.