

Lab notebooks are used to record data during the labs and use for your lab summaries.

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The Synthesis of Magnesium Oxide



Purpose: In the experiment, the group will determine the elemental composition of magnesium oxide. In order to do this, we will have to design an experiment where we can successfully convert magnesium and oxygen into magnesium oxide.

all the steps of the procedure are important to be followed correctly for the results of lab to be accurate as possible.

Procedure:

Labs are applications of the material we learn in class. This lab involves knowledge of molar mass and determining elemental composition.

1. Set up Bunsen Burner
2. determine mass of Magnesium ($1m = max$), using tongs hold strip & ignite using burner. (Do not look directly at the light)
3. Thoroughly clean crucible
4. Set clay triangle on ring stand & transfer the crucible to the triangle
5. Light Bunsen Burner. Adjust flame so ~3-4 in. high w/ bright blue flame in middle.
6. Cool heat the crucible today. When no sign of moisture lower crucible to hotter (lower) region and heat for 5 minutes. Remove from flame & let cool (about 10 min). Then weigh crucible + cover.
7. Repeat steps 5-6, allow it to cool & re-weigh crucible
8. Add 1 tsp of magnesium turnings to crucible & weigh it.
9. Set crucible on clay triangle w/ slight angle w/ cover slightly ajar. Heat gently in cooler region of flame. Continue to heat for 5-10 min. w/ cover of the crucible slightly ajar. Remove heat & let cool for 1-2 min.
10. Remove cover of crucible, if any still damp, cover & heat w/ cool heat for 5 min
11. When dull gray, return cover to slightly ajar & heat crucible w/ full heat for 10 min. Slide cover half open & heat crucible (high heat) for 10 minutes.
12. Remove heat & let contents cool. Add ~10 drops of DI water to crucible.
13. Return the crucible to clay triangle & set cover slightly ajar. Heat crucible w/ cool flame. When all water is evaporated, slide cover half-open & move to high heat. Heat for 5 minutes. Allow cool & then fully cool, weigh crucible & contents

Pre-lab Questions

1. % Hydrogen = $(22.8/250.0 \text{ g}) \times 100 = 9.12\%$

% Oxygen = $(227.2/250.0 \text{ g}) \times 100 = 90.88\%$

How was the elemental composition determined?

1. mole Fe = 55.845 g

1 mole O = 15.9994 g

mole Fe = $69.94 \text{ g} \cdot \frac{1 \text{ mole}}{55.845 \text{ g}} = 1.25 \text{ Fe}$

of moles O = $30.06 \text{ g} \cdot \frac{1 \text{ mole}}{15.9994 \text{ g}} = 1.88 \text{ mole O}_2$

$\frac{1.88}{1.25} \approx 1.50 = \frac{3}{2}$ Fe_2O_3

3. The mass of ammonia will be discarded because it is not the product we are convrtg. Also if the group is careful enough, all of the magnesium and oxygen should be converted to magnesium oxide.

Observations: * Error \rightarrow Scale was loose \rightarrow did not find out until the end.

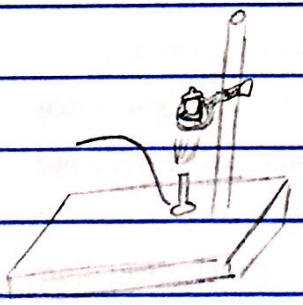
When Taken	Weight	
	no scale	loose scale
After cleaning	7.46 g	3.88 g
After heated	6.27 g	3.88 g
After adding Mg	6.28 g	3.88 g
Final		

How are all the masses recorded on the right column the same?

$\rightarrow 6.86$ w/ diff scale = 20.9 g

-uncontrolled ship \rightarrow once ignited, bright white light, turned to powder (white) of

-Mg slip 1.25 in (1.03g)



does this mean that the experiment was not successful because of equipment? How come?

*faulty equipment \rightarrow no possible calculations \rightarrow 100% error *

Post-lab Qs -

1. Determine the mass oxygen consumed during the combustion reaction for magnesium. The mass of oxygen could not be measured because the group had faulty equipment that severely impacted our data.

2. Determine the elemental composition, mass %

Results: Because the scale was broken, the results for the lab had a 100% percent error. At the end of the lab, we compared the weights on 2 different scales, one read ~7.00 grams, but the other scale read ~20.00 grams.

Conclusion: The hypothesis was neither verified or supported due to the inaccurate data obtained for the experiment. Due to the broken scale, the only way to test the hypothesis is to do the experiment over again using equipment that is working properly.

The hypothesis was not stated in the beginning.

NaCl 2 squirts → orange flame
CaCl₂ 3 squirts → green/teal flame
AlCl₃ 2 squirts → blue/green flame
BaCl₂ 2 squirts → yellow flame
KBr 2 squirts → purple flame
MgCl₂ 2 squirts → blue/teal flame

This information was part of the pre-lab involving the combustion of certain compounds. These compounds were applied with some hydrochloric acid.