

Experiment 4

Determination of the Composition of A Compound

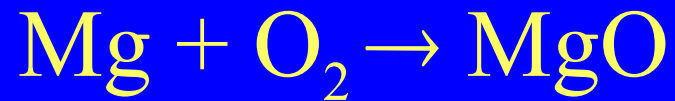
Purpose and Goals

A reaction between magnesium and oxygen will be carried out

and

the percentage composition of the product (MgO) will be determined

1. Equations for Mg combustion in air



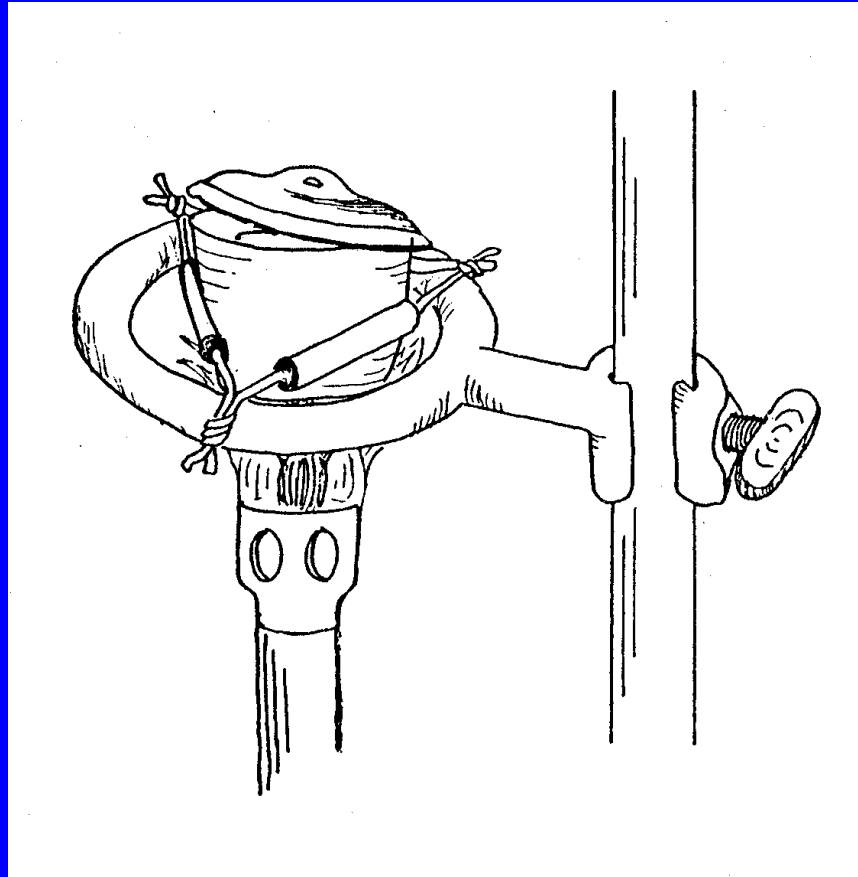
- To convert Mg_3N_2 to MgO



2. Reminders

- Do not wash the crucible and lid when you obtain them. Also, do not scrape the inside of the crucible.
- Always use the crucible tongs to hold the crucible.
- Use the last weight for your calculation, not the average of the 1st, 2nd and/or 3rd heatings.
- Wear the safety goggles.

3. Experimental Procedure



Experimental Set-up for Heating Magnesium

Experimental Procedure

3. Heat the crucible. Use the tongs to hold the lid above the crucible. At the instant the Mg ignites, cover the crucible with the lid quickly.
4. After a brief period, raise the lid and allow the Mg to burn again. Replace the lid at once.
5. Repeat the above step until the contents in the crucible no longer burn.

Experimental Procedure

6. Heat the crucible strongly for 5~10 min with a small opening between the crucible and lid. Let them cool to room temperature.

7. Add 10 drops of distilled water to the crucible.

(to convert Mg_3N_2 to $\text{Mg}(\text{OH})_2$)

8. Reheat the crucible and cover gently at first and then strongly for 5~10min.

(to convert $\text{Mg}(\text{OH})_2$ to MgO)

Experimental Procedure

9. After cooling and weighing, record the mass of crucible , lid and MgO
10. Repeat 8-9, record the mass after the 2nd heating
11. Compare the mass of 2nd heating with that of 1st heating. Make sure you get the constant weight. (difference < 0.002g)

4. Calculations

- Weight of MgO = $W_{\text{crucible+lid+MgO}} - W_{\text{crucible+lid}}$
- Weight of Mg = $W_{\text{crucible+lid+Mg}} - W_{\text{crucible+lid}}$
- Weight of oxygen = $W_{\text{MgO}} - W_{\text{Mg}}$

Calculations (Con.)

- % of oxygen = $W_{\text{oxygen}} / W_{\text{MgO}} * 100\%$
- % of magnesium = $W_{\text{Mg}} / W_{\text{MgO}} * 100\%$

Calculations (Con.)

- % of oxygen calculated from MgO
= $AW_{\text{oxygen}} / MW_{\text{MgO}} * 100\%$
- % error = (experimental value -
calculated value) / calculated value
* 100%

**AW=atomic weight

MW=molecular weight