

Determination of Empirical Formula Online Lab Submission

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Class: Chem 1212

Section: Mondays, 10:30 AM – 1:25 PM

Report Sheet

Weight of empty crucible -- 15.746g

Weight of crucible + magnesium -- 16.004g

Weight of magnesium in crucible -- $16.004 - 15.746 = 0.248\text{g}$

Weight of crucible after heating -- 16.168g

Weight of magnesium oxide present -- $16.168 - 15.746 = 0.422\text{g}$

Weight of oxygen absorbed by magnesium -- $0.422 - 0.248 = 0.174\text{g}$

Moles of magnesium used -- $\frac{0.248\text{g}}{24.305\text{g/mol}} = 0.0102 \text{ mol}$

Moles of oxygen absorbed -- $\frac{0.174\text{g}}{15.999\text{g/mol}} = 0.0109 \text{ mol}$

Ratio of magnesium/oxygen -- $\frac{0.0102}{0.0109} = 0.936$

% error in experiment -- $\frac{0.936-1}{1} \times 100\% = -6.4\%$

Pre-Lab Questions

1. Calculations

- Moles of magnesium -- $\frac{2.00\text{g}}{24.305\text{g/mol}} = 0.0822 \text{ mol}$
- Moles of oxygen -- $\frac{3.33\text{g}-2.00\text{g}}{15.999\text{g/mol}} = 0.0831 \text{ mol}$
- Molar ratio of magnesium/oxygen -- $\frac{0.0822\text{mol}}{0.0831\text{mol}} = 0.989$

2. You can heat magnesium nitride up to decompose the compound.

Post-Lab Questions

1. Calculations

- Moles of iron -- $\frac{2.97\text{g}}{55.845\text{g/mol}} = 0.0532 \text{ mol}$
- Moles of oxygen -- $\frac{4.25\text{g}-2.97\text{g}}{15.999\text{g/mol}} = 0.0800 \text{ mol}$
- Ratio of iron to oxygen -- $\frac{0.0532\text{mol}}{0.0800\text{mol}} = 2/3$

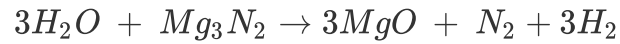
- Empirical Formula -- Fe_2O_3

2. Calculations

- Moles of copper -- $\frac{0.444g}{63.546g/mol} = 0.00699 \text{ mol}$
- Moles of oxygen -- $\frac{0.500g-0.444g}{15.999g/mol} = 0.00350 \text{ mol}$
- Ratio of copper to oxygen -- $\frac{0.00699mol}{0.00350mol} = 2$
- Empirical Formula -- Cu_2O

3. The crucible and lid are extremely hot, and will burn any stray fingers

4. A.



B. If the Mg_3N_2 is not decomposed, the reported ratio will be low, because some Mg:N has a lower mass ratio.