PROCEDURE

1. Construct a setup for heating a crucible as shown in Figure A and as demonstrated in the Pre-Laboratory Procedure "Gravimetric Analysis."
2. Heat the crucible and lid for 5 min to burn off any impurities.
3. Cool the crucible and lid to room temperature. Measure their combined mass, and record the measurement on line 3 of your data table.

   NOTE: Handle the crucible and lid with crucible tongs at all times during this experiment. Such handling prevents burns and the transfer of dirt and oil from your hands to the crucible and lid.
4. Polish a 15 cm strip of magnesium with steel wool. The magnesium should be shiny. Cut the strip into small pieces to make the reaction proceed faster, and place the pieces in the crucible.
5. Cover the crucible with the lid, and measure the mass of the crucible, lid, and metal. Record the measurement on line 1 of your data table.
6. Use tongs to replace the crucible on the clay triangle. Heat the covered crucible gently. Lift the lid occasionally to allow air in.

   CAUTION: Do not look directly at the burning magnesium metal. The brightness of the light can blind you.
7. When the magnesium appears to be fully reacted, partially remove the crucible lid and continue heating for 1 min.
8. Remove the burner from under the crucible. After the crucible has cooled, use an eyedropper to carefully add a few drops of water to decompose any nitrides that may have formed.

   CAUTION: Use care when adding water. Using too much water can cause the crucible to crack.
9. Cover the crucible completely. Replace the burner under the crucible, and continue heating for about 30 to 60 s.
10. Turn off the burner. Cool the crucible, lid, and contents to room temperature. Measure the mass of the crucible, lid, and product. Record the measurement in the margin of your data table.
11. Replace the crucible, lid, and contents on the clay triangle, and reheat for another 2 min. Cool to room temperature, and remeasure the mass of the crucible, lid, and contents. Compare this mass measurement with the measurement obtained in step 10. If the new mass is ±0.02% of the mass in step 10, record the new mass on line 2 of your data table and go on to step 12. If not, your reaction is still incomplete, and you should repeat step 11.
12. Clean the crucible, and repeat steps 2–11 with a second strip of magnesium ribbon. Record your measurements under Trial 2 in your data table.

CLEANUP AND DISPOSAL

13. Put the solid magnesium oxide in the designated waste container. Return any unused magnesium ribbon to your teacher. Clean your equipment and lab station. Thoroughly wash your hands after completing the lab session and cleanup.

ANALYSIS AND INTERPRETATION

1. **Applying Ideas:** Calculate the mass of the magnesium metal and the mass of the product.
2. **Evaluating Data:** Determine the mass of the oxygen consumed.
3. **Applying Ideas:** Calculate the number of moles of magnesium and the number of moles of oxygen in the product.

CONCLUSIONS

1. **Inferring Relationships:** Determine the empirical formula for magnesium oxide, Mg_xO_y.