

Calcium Metal in Water

A QUANTITATIVE INVESTIGATION

Read the procedure on page 165 of the green Science 10 textbook.

COLLECT the FOLLOWING MATERIALS:



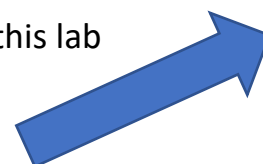
Be sure that you are using the spaces and labeled items that match your table number.

Example: Table 2 uses matchbox #2 at lab station #2.

Yes, Mrs. Toombs needs you to return the matchbox, even if it is empty! Do NOT destroy it!

Please note that Mrs. Toombs has made some changes to simplify this lab investigation. Read these changes carefully.

They are clearly listed [HERE](#)



PROCEDURE that we will follow.

NOTE THAT Steps marked with a ******* have been changed from what the textbook says.

1. ******* Be careful not to touch the Calcium or ANY of the test tubes while the reaction is occurring. There is a danger of burning yourself.
2. When recording observations, please think about the chemical and physical changes that you notice as the reaction occurs.
3. Do as instructed on page 165. **DO NOT LET THE LARGE TEST TUBE ROLL OFF THE TABLE!**
4. ******* You don't need this step – Mrs. Toombs will give you matches and a wooden splint instead.
5. ******* Mrs. Toombs did this ahead of time – proceed to step 6 **WITHOUT** touching the Calcium with your hands.

******* Before proceeding to step 6 and 7, make sure you and your lab partner(s) have a **WELL TIMED PLAN!** You only have one shot at it!

6. **USE THE PROVIDED TWEEZERS.**
7. ******* This is the step you need to be prepared for. Have a plan **AHEAD OF TIME** so that one partner is carefully raising the upside down **LARGE** test tube, while the other partner is bringing the burning splint to the mouth of that upside down tube.
8. ******* There won't be time to repeat the experiment.
9. ******* Think about what you witnessed. Will your observations help you to answer the **WHAT DID YOU FIND OUT** questions?
10. ******* Mrs. Toombs will show you how to return all materials to the front of the room. **DO NOT PUT ANYTHING** down the sink, or in the garbage!!!!
DO NOT leave any materials on your desk or lab station!

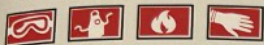
As a team, jot down some answers to the WHAT DID YOU FIND OUT questions.

Calcium Metal in Water

Find Out ACTIVITY

In this activity, you will add calcium metal to water. Work safely and cooperatively. Use this opportunity to increase your laboratory skills.

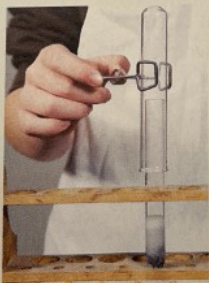
Safety



- Avoid touching the calcium. Calcium reacts with moisture, including the moisture on your hands.
- Follow your teacher's directions regarding using open flames.
- Tie back long hair.
- Be sure to wear eye protection.
- Avoid touching all reactants and products.
- Wash your hands and equipment thoroughly after completing this activity.
- Do not remove any materials from the science room.

Materials

- medium diameter test tube
- test tube rack
- large diameter test tube (to fit over medium test tube)
- water
- matches or flame striker
- candle or Bunsen burner
- sandpaper or triangular file
- calcium metal
- paper towel
- test tube tongs
- wooden splints



Step 4

What to Do

1. Your teacher will review the detailed safety information on pages xxii to xxv before you begin this activity.
2. Create a data table to record observations you make during the activity. Give your table a title.
3. Place the medium test tube in the test tube rack. Make sure the large test tube will fit over the medium test tube. Set the large test tube aside, such as in the spine of your opened textbook. Place water in the medium test tube to a depth of about 3 cm.
4. Set up a lit candle or Bunsen burner according to your teacher's instructions.
5. Use sandpaper or a triangular file to expose a fresh piece of the calcium metal surface. Do this over a piece of wet paper towel. Be sure to wear gloves. Do not touch the calcium with your bare hands. Observe.
6. Place the calcium metal into the water in the medium test tube. Slide the large test tube over the mouth of the medium one.
7. Observe for about 30 s, then use test tube tongs to lift the large test tube off the medium one. Keeping the large test tube turned upside down, bring a lit wooden splint near the mouth of the large test tube. Firmly hold on to the large test tube. Be prepared for a reaction, and do not drop the test tube!
8. Repeat the experiment if time permits.
9. Record your observations.
10. Clean up and put away the equipment you have used. Follow your teacher's instructions for disposal of wastes.

What Did You Find Out?

1. Reflect on this activity in terms of laboratory safety. What safety issues are important to this activity?
2. (a) What physical changes did you observe?
(b) What chemical changes do you think happened? Explain.