

Making an Alloy

PROBLEM

What are the characteristics of the alloy, brass?

INTRODUCTION

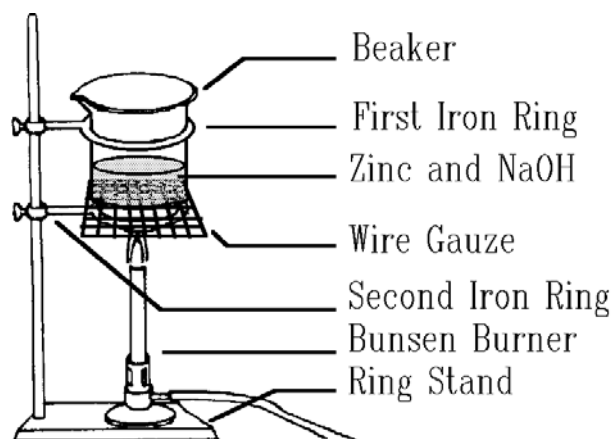
An alloy is a mixture of metals. Substances in a mixture do not lose their characteristics. The characteristics of a mixture are a blending of the characteristics of the individual substances in the mixture. In this laboratory investigation, you will prepare brass, an alloy of copper and zinc. Then you will examine the alloy to see how its characteristics are a blending of the characteristics of zinc and copper.

MATERIALS (per group)

Balance; 250 mL beaker (2); Bunsen burner; graduated cylinder; pennies (3); ring (2); ring stand; safety goggles; scoop; 1 M sodium hydroxide; steel wool; tongs; weighing paper; zinc

PROCEDURE

1. Set up a ring stand with two iron rings like the one shown to the right. Make sure the beaker fits through the top ring.
2. With a graduated cylinder, measure approximately 50 mL of sodium hydroxide. Pour it into a 250 mL beaker. *CAUTION:* Sodium hydroxide can burn the skin. If you get sodium hydroxide on your skin, flush it with cold water.
3. Place a piece of weighing paper on a balance and measure out approximately 5 g of zinc filings. Pour the zinc into the sodium hydroxide.
4. Place the beaker of sodium hydroxide and zinc on the ring stand through the top ring, and onto the wire gauze. Fill a second beaker with cold water and set it aside.
5. Polish three pennies with steel wool. Place two of the pennies into the beaker of sodium hydroxide and zinc.
6. Put on safety goggles and light your Bunsen burner. Heat the sodium hydroxide, the zinc, and the pennies on a low flame. If the sodium hydroxide begins to boil, lower the flame or turn it off. Then, if necessary, begin heating again. Keep heating until the color of the pennies changes and their color is uniform.
7. After the pennies change color, turn off the Bunsen burner. Remove the pennies from the sodium hydroxide with tongs and rinse them in the beaker of cold water.
8. Move the Bunsen burner away from the ring stand and relight it. Pick up one of the treated pennies with tongs and hold it in the flame until the color changes again (about 2 minutes). Then plunge the penny immediately into the beaker of cold water.



9. Examine the color of the zinc filings and of the three pennies. Note whether the pennies appear to have metallic luster. Record your observations below.

~~OBSERVATIONS~~ **OBSERVATIONS**

Description of Material Being Observed	C o l o r	Luster (YES or NO)
Zinc Filings		
Polished Penny		
Penny Treated with NaOH and Zinc		
Treated Penny after Heating in Bunsen Burner Flame		

~~CONCLUSIONS~~ **CONCLUSIONS**

- Do all three pennies appear to be metals even after treatment. Justify your answer. (Hint: Refer to color and luster.) _____

- Were the changes you observed chemical or physical? Justify your answer. (Hint: Did metals still remain after the changes? All metals are elements.) _____

- What material forms the outside of a polished penny? _____
- What coating is on the outside of the penny after being heated in a beaker of zinc and sodium hydroxide? How do you know? (HINT: Refer to color and luster) _____

- After the heating the treated penny in a Bunsen burner flame, the penny is coated with brass. What are the characteristics of brass show that it is a mixture of zinc and copper? _____

