

Using properties to identify materials

Forensic chemists test the physical and chemical properties of material found at a crime scene. They also do similar tests on the materials found on a suspect's skin or clothing. These materials are often complex mixtures, such as soil, which contain many substances. In this lab, you will compare the properties of materials and compare them to known evidence. Although your materials and equipment are less complex than those used by forensic chemists, your overall method will be similar to the method they use.

Problem: Can the properties of materials that appear similar be used to tell them apart?

Materials: Spot plate or Petri dishes, spoon, mystery powders, water, vinegar, iodine, eye droppers

Procedure:

1. Observe a mystery powder– note any color, texture, smell to it.
2. Using the spoon, place a small amount of mystery powder into three different spot plates or Petri dishes. Wipe spoon off before using in another powder.
3. Using a different eye dropper for each solution, carefully drop five drops of water onto ONE of the powder spots. You may use eye dropper to mix if needed. OBSERVE AND RECORD ANY CHANGES (dissolving, bubbling, color change, texture change)
4. Using a different eye dropper for each solution, carefully drop five drops of iodine onto ONE of the powder spots. OBSERVE AND RECORD ANY CHANGES (dissolving, bubbling, color change, texture change)
5. Using a different eye dropper for each solution, carefully drop five drops of vinegar onto ONE of the powder spots. OBSERVE AND RECORD ANY CHANGES (dissolving, bubbling, color change, texture change)
6. If you have run out of spot to place new powder, RINSE and DRY spot plate before moving to next mystery powder.
7. REPEAT steps 1-6 with the remaining mystery powders
8. After you have completed all the tests, talk with your group as to what you think the powder is based on what happened.

Mystery Powder #	Initial observations	Observations and reactions of the powder			Powder guess
		Water	Vinegar	Iodine	

Explain what happened with **each** of the powders that led you to come to the conclusions that you did.

Which powder was the easiest to figure out? Why?

What properties were observed? (physical or chemical or both?) How did you know?