

Name _____

Date _____

Analysis of White Powders

Rationale

This is a hands-on activity to simulate testing drugs in a toxicology lab. Various common white powders are used to represent drugs. In this lab, students will compare the physical and chemical properties of various white powders and also attempt to identify an unknown sample from known samples.

Materials (Per Group)

- 1 container each of the following:
 - Popcorn salt
 - Powdered sugar
 - Starch
 - Baking soda
 - Plaster
 - Unknown substance
- Vinegar
- Iodine
- Distilled water
- 3 petri dishes (1 bottom or top for each powder substance)
- Gloves
- Goggles
- 6 plastic spoons (1 for each of the powder substances)
- Grease pencil for marking petri dishes
- 18 Toothpicks
- Magnifying glass

Procedure:

1. Put on goggles and gloves (*Note: use caution with iodine as it may stain clothing; a lab apron may be used*).
2. Use a grease pencil to label one of the petri dishes (top or bottom) "Salt." Repeat this step with each of the powder substances until all 6 dishes are labeled.
3. Using a plastic spoon, scoop about $\frac{1}{2}$ tsp. of the salt into the petri dish marked "Salt" (this measurement is an approximation; about the size of a dime). Repeat this process with the other powder substances until all of the dishes are filled. Always keep the spoons with the appropriate powders. Do not cross contaminate.
4. Using the magnifying glass, observe each powder and record the visible characteristics: color, appearance (shiny, dull, small crystals, fine powder, etc.). Record your results on Data Table 1.
5. Add 3 – 5 drops of water to each of the powders, and stir with a toothpick. Discard the toothpick after stirring and be careful not to cross contaminate.
6. Observe and record any changes such as color, bubbling, heat (also feel the bottom of the dish).

7. Thoroughly clean the dishes, and repeat step 3 with each of the remaining liquids being careful not to cross contaminate. Record your results in the data table after each test.
8. After testing each of the powders with each of the liquids, compare the unknown sample to the known substances.
9. Answer the questions at the end of this handout.

DATA TABLE 1*

Substance	Color	Crystal Shape	Water	Vinegar	Iodine
Popcorn Salt					
Powdered Sugar					
Starch					
Baking Powder					
Plaster					
Unknown					

* Record NR for "No Reaction" if the substance does not react to the liquid in any way

Questions

1. Understanding the difference between physical and chemical characteristics, list the ones you observed below:

Physical _____

Chemical _____

2. In your opinion, which type of characteristic is easier to analyze: physical or chemical? Why?

3. Were you able to tell what substance(s) the unknown is? If yes, which was it, and how did you come to this conclusion? If not, why not?

4. Explain how this lab is related to real-life situations testing unknown drugs, poisons, or other substances.
