

Background

When you observe matter - whether you see it, touch it, hear it, smell it, or taste it - you are observing its characteristics, called physical properties. A physical property is a characteristic or description of a substance that may help to identify it. Unlike a chemical property, a physical property does not involve a substance becoming a new substance. A substance simply has a certain colour: its colour has no relationship to the substance's ability to change into new substances.

Question:

What is the identity of each of the unknown substances?

Hypothesis:

If we make observations of unknown substances, then we should be able to determine their identities because each substance has a characteristic property that will help to identify it.

Materials:

10 vials of unknown substances

Method:

1. Make a table similar to the one below to record (i) the physical properties & (ii) possible identity of 10 unknown substances.

VIAL	PHYSICAL PROPERTY						IDENTITY?
	STATE	COLOUR	CLARITY	SHAPE	VISCOSITY	ODOUR	
①							
②							
③							

* state is either solid, liquid, or gas

* clarity refers to how clear a substance is or how easy it is to see through the substance (i.e. terms such as transparent, translucent and opaque are used)

* shape (crystal) is used for solids

* viscosity refers to how easily a liquid flows: the thicker the liquid, the more viscous it is (i.e. water has a "low" viscosity while honey has a "high" viscosity)

2. Get a numbered vial.
3. Make qualitative observations of the substance in the vial and record them in the table. (You may open the vial to smell the substance ONLY. Do not touch/taste/spill the substance. Be sure to put the cap on securely when you are finished!)
4. Try to identify each substance. Record your guess in the table.
5. Return the vial to the container. Repeat steps 2 to 5 until all 10 substances are completed.

Analysis (Be sure to use complete sentences when answering the following! Don't forget a lead-in sentence.)

- {3} 1. Which of the five senses (i.e. sight, smell, touch, hearing, taste) did you use for your observations? Why?
- {3} 2. Which of the five senses did you not use? Why?
- {3} 3. Which of the physical properties was the easiest to use? Why?
- {3} 4. Which samples were the most difficult to identify? Explain.

NOTE:

This is a "practice" formal lab. We will write up the lab together using the QHMMOCA format so that you have an understanding of what is required for a formal lab. You may find the "Lab Report Scheme" handout (available through the wiki) very useful. You need to understand that lab reports are evaluated on a number of levels including spelling and grammar, form, and content. Simply handing in a table of observations and the answers to the questions is not acceptable when a formal lab report has been requested.