

Simple Qualitative Analysis

Reminder – Goggles must be worn at all times in the lab!

PRE-LAB DISCUSSION:

Qualitative analysis is the process by which a scheme of simple physical and chemical tests is used to identify an unknown. This series of tests, **when performed in the proper order**, is capable of distinguishing each compound from all of the others. If steps are skipped, or the tests are performed out of sequence, then all bets are off, and mistakes are likely to occur.

You will first have the opportunity to develop your own scheme for differentiating each compound from the others. There is no ONE CORRECT system for identifying these compounds. Your tests should all be semi-micro (small scale) tests, and require only small quantities of each compound in order to complete the identification scheme. You are allowed to use the Internet in developing your plan. “Taste” may NOT be used as a test!

It is especially important to clean test tubes and other glassware between tests. Compounds or reagents left behind by previous tests are a common cause of poor results in qualitative schemes such as this.

Compounds

Sodium carbonate
Calcium carbonate
Boric acid
Calcium Sulfate
Glucose

Reagents and Tools

Universal indicator (pH)
Vinegar (acetic acid solution)
Conductivity tester
Other materials as requested

PURPOSE:

The purpose of the lab is to develop a qualitative scheme to differentiate between five compounds of similar physical appearance, and to use that scheme to successfully identify the compounds in a set of unknowns.

PROCEDURE:

- *Day 1:* Develop a scheme that differentiates and CONFIRMS each substance. In other words, you must have a test that positively identifies a substance rather than simply identifying it by eliminating all of the other possibilities. You will include all of these tests in your schematic.
- *Day 2:* You will practice with unknowns provided by your instructor to confirm that your scheme works in identifying the compounds correctly.
- *Day 3:* Identification of a set of unknowns provided by your instructor FOR A GRADE.

Rules on the Day of the Lab Final:

1. Each correctly identified unknown is worth 8 points. The lab final is worth 40 points total.
2. You will work at a lab table, and with students with whom you choose to work.
3. You are not obligated to agree with anyone at your table – you each submit your own answers.
4. You will have available to you all of the reagents used to identify the compounds during practice.
5. Your group will have only the equipment provided in your lab drawers throughout the year.
6. Each lab table will draw five bottles to identify. You may not exchange bottles with other tables. You may not have students from other tables perform tests for you.
7. All lab safety rules will be enforced. I will give each student ONE warning about safety violations, including goggles. After that, each warning costs you **five** points.
8. You have one lab period within which you must identify the five unknowns. Scores will not be provided until all class periods have completed the final.
9. You may use any handwritten (not printed) notes or diagrams. You may NOT access the Internet, either with a phone or with a Chromebook.

Your Instructor will:

1. Fill up reagents if they run low

Your instructor will NOT:

1. Fill distilled water bottles
2. Refill your unknowns if you run out. Each bottle will have more than enough to run the identifying tests.
3. Answer questions about qualitative results of tests that you run