Grade 9 - Identifying Substances LAB Name:

**Problem:**

1) How can the properties of a substance be used to identify it?

**Hypothesis:**

**Materials:**

* Sodium Carbonate
* Sodium Bicarbonate
* Baking Soda
* Corn Starch
* Salt
* 5% hydrochloric acid
* 5% calcium hydroxide
* iodine solution
* wax paper or spot plate
* disposal containers

**Procedure:**

*Part 1—Examining Five Substances*

1. Copy the table shown on the next page into your notebook.

2. Collect five substances from your teacher.

3. Perform the tests described below to identify the properties of the substances. You

do not have to do the tests in the order shown below, but you must do all of them.

4. Make sure the data table is completely filled in before you begin part 2 of the activity.

Test 1—Appearance

5. Use one sheet of black paper for all your samples. Place a small amount of each

powder in different places on the same sheet of black paper. Make sure that your

powder samples are not touching each other.

6. Describe the appearance of each powder. Record your observations in the data table.

Test 2—Crystal shape

7. Use a hand lens or microscope to examine the grains of each powder. Record your

observations in the data table.

8. Dispose of the powders and the black paper in the container provided.

Test 3—Behaviour in water

9. Use one large sheet of wax paper or a spot plate for all your samples. Place a small

amount of each powder on the wax paper or spot plate.

10. Add a drop of water to each powder. Record your observations in the data table.

11. Dispose of the powders and the wax paper in the container provided. Clean the spot plate.

Test 4—Behaviour in acid

12 Place a small amount of each powder on a new sheet of wax paper or a clean spot

plate.

13. Add a drop of 5% acetic acid solution or 5% hydrochloric acid solution to each

powder. Record your observations in the data table.

14. Dispose of the powders and the wax paper in the container provided. Clean the spot plate.

Test 5—Behaviour in iodine

15. Place a small amount of each powder on a new sheet of wax paper or a clean spot plate.

16. Add a drop of iodine solution to each powder. Record your observations in the data

table.

17. Dispose of the powders and the wax paper in the container provided. Clean the spot plate thoroughly.

*Part 2 - Unknown Sample*

18. Collect an unknown sample from your teacher. Record the letter or number of the

sample in the data table next to the word “unknown.”

19. Determine the properties of the unknown sample by repeating the five tests above,

and record your observations in the data table

**Variables:**

Manipulating Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Responding Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Observations:**

(Behaviour key words: fizzed, bubbled, dissolved, unchanged, etc)

(Appearance key words: transparent, opaque, translucent, round edge, rectangular, circular, etc)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Substance** | **State** | **Appearance** | **Crystal Shape** | **Behaviour in Water** | **Behaviour in Acid** | **Behaviour in Iodine** |
| Salt |  |  |  |  |  |  |
| Sodium Bicarbonate |  |  |  |  |  |  |
| Corn Starch |  |  |  |  |  |  |
| Sodium Carbonate |  |  |  |  |  |  |
| Calcium Carbonate |  |  |  |  |  |  |
| Unknown |  |  |  |  |  |  |

**Analysis:**

1. For each substance, one or two tests clearly identified it as being unique from the

other substances. What were those tests for each of the white powders?

2. Were some tests more useful than others? Explain your answer.

3. Name at least 2 chemical reactions that occurred (ex. Sodium Bicarbonate & Water), explain for each why you think this is a chemical reaction?

4. What substance or substances were in your unknown sample?

**Reliability/Validity:**

**Conclusion:**

**References:**