IDENTIFICATION & ANALYSIS OF UNKNOWNS

Experiment 13

INTRODUCTION:

Part of the fun of chemistry is being able to identify different substances by test. To identify substances, chemists use reagents that are known chemicals or mixtures of chemicals. When a reagent is added to a sample being tested, it may or it may not produce an ***observable change***. Both the ***positive*** and the ***negative*** results will help ***identify the unknown*** sample being tested.

In this experiment, several simple household chemicals, four powders and three liquid reagents, will be used. A series of tests will be performed that will help you find out how each of the powders behaves when the liquid reagent is added. When performing the tests, look for both POSITIVE RESULTS (color changes or production of gas bubbles) as well as NEGATIVE RESULTS (no observable change), since both positive and negative results carry the same significance in chemical analysis.

After you establish the tests that identify or indicate a difference between the four powders, you will analyze two samples of unknown composition: each unknown sample will be a mixture of two powders (identified with a 2-digit number).

MATERIALS :

POWDERS	*LIQUID REAGENTS*
A: Baking Soda	I: White Vinegar
B: Corn Starch	II: Iodine Tincture
C: Alka Seltzer	III: Distilled Water
D: Table Salt	

RECORDING DATA:

1. Prepare data tables in your notebook using as a model those given in the Report form.
2. After completing each step of the procedure, record your results in the data tables prepared in your notebook (**NOT on the Report Form**).
3. At the completion of the experiment, when you are sure of your observations and conclusions, transfer your answers to the Report Form.

PROCEDURE:

Part I: Identification

1. Using a spatula, place small amounts of the four powders in each of the 12 depressions of the test plate as shown in the diagram below.
2. Into three clean test tubes (need not to be dry), place about 2 ml of the White Vinegar, Iodine Tincture, and Distilled Water. Label these test tubes. Place into each of the test tubes a Pasteur pipet.

Note: To avoid ***contamination***, always be sure to use the ***same pipet*** for the ***same liquid reagent***.

3. To each of the 12 solid samples add a few drops of the three liquid reagents, in the manner indicated in the diagram below.
4. Record your observations. At the conclusion of Part I, briefly describe how you can ***conclusively*** identify each powder.

White Vinegar	?	Baking Soda	Corn Starch	Alka Seltzer	Table Salt
Iodine Tincture	?	Baking Soda	Corn Starch	Alka Seltzer	Table Salt
Distilled Water	?	Baking Soda	Corn Starch	Alka Seltzer	Table Salt

Test Plate

Part II: Analysis of Unknowns

1. Obtain your unknowns from the instructor and record their numbers.
2. Test each unknown sample with each of the three liquid reagents in the same manner as was done in Part I. Record the results of your tests.
3. Based on your observations and the information obtained in Part I, identify the composition of your mixtures.

REPORT FORM
Experiment 13

Part I: Identification:

1. Results:

	Baking Soda	Corn Starch	Alka Seltzer	Table Salt
White Vinegar				
Iodine Tincture				
Distilled Water				

2. Conclusions: Briefly describe how you can identify each powder. Your conclusions should be brief, but to the point. (**Hint**: Consider in which way the four powders are different from each other, based on their behavior toward the three reagents).

A: Baking Soda: _____

_____

B: Corn Starch: _____

_____

C: Alka Seltzer: _____

_____

D: Table Salt: _____

_____

Part II: Analysis of Unknown:

1. Unknown Numbers: _____ _____

2. Results:

	Unknown #	Unknown #
White Vinegar		
Iodine Tincture		
Distilled Water		

3. Conclusions:

(a)

Unknown # _____ contains:

_____

_____

(b)

Unknown # _____ contains:

_____

_____