Rockets, Reactions & Ratios
Interpreting Qualitative Results

Introduction

Though much of the data collected during your testing and competition with your classmates was quantitative (numbers were used in the description) there also was an abundance of qualitative data. Qualitative observations include all of the non-numerical information that your senses take in. Unfortunately, the value of qualitative observations is often underestimated and therefore, they often go unrecorded. The saying "if you didn't record it, you didn't observe it" should not be taken lightly. Disputes regarding scientific discoveries and inventions are often settled by evaluating lab notebooks. This worksheet will help expose the value in the qualitative data observed during Rockets, Reactions & Ratios.

Review

1. What is a chemical reaction?

2. What are the common names of the reactants in this lab?

3. Review your lab notes. List the specific evidence that you *recorded in your lab notes,* that supports that a chemical change occurred.

4. Think of the senses (touch, smell, hearing, sight) except taste. What additional evidence can you recall that supports that a chemical change occurred?

Analysis

1. The chemical names of the reactants are acetic acid and sodium bicarbonate. Use the skills you have learned in chemistry to translate the names of the reactants into formulas:

_____ + _____

acetic acid sodium bicarbonate

2. Given that the Law of Conservation of Matter tells us that matter is neither created nor destroyed, list the elements that must be present in the products.

Submitted by Deborah J Maloney, PO Box 1222, Wilton, NH 03086 email dm1thes411@yahoo.com

3. A chemical reaction means new substances are formed from the starting materials (reactants). Using your list of common ions and knowledge of molecules, list at least 10 compounds (other than sodium bicarbonate and acetic acid) that have combinations of these elements in them. Recall that a compound must be neutral. You must use every element at least twice. Record your compounds (formula and name) in Table 1. Make a check mark in the appropriate column to indicate the type of bond present in each compound listed.

Table 1. Possible Products

Compound		Bond Type	
Formula	Name	Ionic	Covalent

4. Recall the properties that distinguish molecular compounds from ionic compounds. Use this knowledge, your solubility rules and observations made during the experiment to choose the 5 most likely substances to have been produced in the reaction. Record your choices in Table 2.

Table 2. Most Likely Products

Compound	Supporting Evidence and Inferences

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