**Q1L3 Observation & Experiment**

**Part I: Mix the following:**

**1. ¾ of a spoonful of sodium bicarbonate 🡪NaHCO3**

**2. ¾ of a spoonful of calcium chloride 🡪CaCl2**

**3. Fill 2 pipets 2/3 full with water 🡪 H2O**

**4. Fill 2 pipers 2/3 full with phenol red indicator 🡪C19H14O5S**

Record ALL observations (**four total**) on a data table that you create:

**Sample** Part I Data Table: Observations

|  |
| --- |
| **1.**  **2.**  **3.**  **4.** |

**Part II: Controlled experiments**

**Using roughly the same quantities used in Part I you must create at least NINE controlled experiments to determine the most likely cause of the observations you saw in part I. Your data table might look like this:**

**Sample Part II Data Table Experiments & Observations:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exp #** | **Calcium chloride** | **Sodium bicarbonate** | **Phenol**  **red** | **Distilled**  **H2O** | **Observations** |
| **1** |  |  |  |  |  |
| **2** |  |  |  |  |  |
| **3** |  |  |  |  |  |
| **4** |  |  |  |  |  |
| **5** |  |  |  |  |  |
| **6** |  |  |  |  |  |
| **7** |  |  |  |  |  |
| **8** |  |  |  |  |  |
| **9** |  |  |  |  |  |

**Post Lab Questions (PLQ):**

*You must TYPE your* ***answers*** *in complete sentences!*

1. Write out the procedural steps your group used for Part I and II.
2. What was the purpose of the nine controlled experiments?
3. Create a **results table** that summarizes the results of each of the nine controlled experiments that **specifically** helped you identify which combination(s) were most likely responsible for the four observations you saw in part I.
4. Did temperature or color changes always occur at the same time as the formation of a gas? Be specific
5. Was a liquid was necessary for the overall effects seen in Part I? Explain
6. Consider the following: chemists describe a chemical change as one where a new substance is produced with new properties.
   1. Describe the BEST evidence from the Data collected in Part II that suggests a new chemical substance is produced in Part I? Explain
7. Consider the following: chemists describe a physical change as those changes that simply change the form of the substance and not the identity.
   1. The solids used in this lab, when mixed with water, behaved exactly like salt would when mixed with water. That is they dissolved or were soluble. Why is this an example of a physical change? Explain
   2. Using your answer from (7a) suggest an experiment that could be done to prove why placing either solid (calcium chloride or sodium bicarbonate) in water is a physical change
8. Let’s consider temperature changes… (a) Temperature changes are often considered evidence that a chemical change has occurred (temp increase or decrease). Can you find and describe one common example of a chemical change accompanied by a temperature change? (b) A temperature change also can accompany a physical change. Use your data from Part II to describe a physical change that produces a temperature change (temp increase or decrease). (hint: there were two in this lab!)
9. Explain how this lab activity as a whole demonstrates the scientific method? NOTE: You must explain in detail and it must be done **in terms of the scientific method** so if you don’t remember then be resourceful and remind yourself of the terms and the overall process called the scientific method)
10. For each chemical compound used in this lab write the name, IUPAC formula and the ratio of atoms in the compound.
11. Research…IUPAC is an acronym for a globally important organization of chemical scientists.
    1. What does IUPAC stand for?
    2. What does this group do?
    3. Do they have anything to do with the formula and names for the chemical you used in this lab and in general for chemistry? Explain