**FIZZY DRINK LAB**

1. What is the molar mass of citric acid, H3C6H5O7?
2. Data Table

**Part 1**

|  |  |  |  |
| --- | --- | --- | --- |
| Trial | Ingredients | Observations | Taste |
| 1. | ¼ Dixie cupful Kool-Aid® |  |  |
| 2. | ¼ Dixie cupful of Kool-Aid® + 0 .5 g Citric Acid |  |  |
| 3. | ¼ Dixie cupful of Kool-Aid® + 0.5 g Baking soda (sodium bicarbonate, NaHCO3) |  |  |

**Part 2**

1. The Chemical Reaction
2. Write the chemical equation for this reaction.

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Citric acid + baking soda 🡪 sodium citrate + water + carbon dioxide

1. Is the reaction balanced? If not, rewrite the equation below and add coefficients as needed.
2. Check with the teacher before continuing. Teacher initials: \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Calculate your recipe:

THE BIG IDEA: You will be given exactly 0.3 grams of citric acid. You need to calculate how many grams of baking soda (NaHCO3)should be added to make a fizzy Kool-Aid® drink that is “just right”.

1. Convert 0.3 grams of citric acid (H3C6H5O7) into **moles**.
2. Use the **mole ratio** of baking soda (NaHCO3)to citric (H3C6H5O7 )to calculate how many moles of baking soda will react with the number of moles of citric acid that you determined in #1.
3. Calculate the molar mass of baking soda (NaHCO3)
4. Convert the moles of NaHCO3 to **grams** of NaHCO3:
5. Prepare the Drink

You now have your recipe for your Fizzy Drink:

\_\_\_\_\_\_\_ g of citric acid \_\_\_\_\_\_\_ g of baking soda (NaHCO3)

Before continuing, have the teacher check your recipe. Teacher initials: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Procedure**

1. Fill a Dixie cup with Kool-Aid®. Pour the Kool-Aid® from the Dixie cup into a larger cup (to prevent bubble-over of mixture).
2. Now add your calculated amounts of citric acid (H3C6H5O7) and baking soda (NaHCO3)in the recipe above to the Kool-Aid®.
3. Mix and taste (pour into several small cups if more than 1 person wants to try it).
4. Record observations on the data table.
5. Questions
6. How did your drink turn out?
7. How could you modify your recipe to make it better?
8. If you have 10.0 grams of citric acid with enough baking soda (NaHCO3)how many moles of carbon dioxide can you produce?
   1. Calculate moles of citric acid:
   2. How many moles of carbon dioxide will be produced from the number of moles of citric acid that you determined in 3a?
9. If you have 10.0 grams of baking soda (NaHCO3)with enough citric acid, how many moles of carbon dioxide can you produce?
10. Refer to the moles of CO2 produced in questions 3 and 4. Which reactant, citric acid or baking soda (NaHCO3), produced less CO2?
11. If you mixed 10 grams of each reactant in a container, would both of them be used up completely? How do you know?

The mole ratio of citric acid (H3C6H5O7) to baking soda (NaHCO3) is 1:3. Randy wants to add 1 gram of citric acid to 3 grams of baking soda . Is this correct? Why or why not?