

43.4: Procedures

Safety

- Rubber gloves and safety goggles are recommended for this lab.
- Phenolphthalein Solution is harmful if ingested.

Warnings

- Always read the label and make sure you are obtaining the correct chemical.
- The Universal Indicator and the Phenolphthalein are different chemicals; be sure to use the correct one.
- Never obtain chemicals directly from large storage container to avoid cross contamination. Use a beaker.
- Do not re-use pipettes! Pipettes are intended for single use only so chemicals are not mixed unintentionally. Some chemicals used in this experiment can be hazardous if misused!

You will observe color changes as your solution changes acid/base levels.

Changing Colors

Draw a table in which to record your observations. **Do not fill in observations until you have read the instructions.**

Table 43.4.1: Changing Colors

Stage of Experiment	Color	Acidic or Basic
1st Beaker added to 2nd Beaker		
2nd Beaker added to 3rd Beaker		
3rd Beaker added to 4th Beaker		

1. Use the grease pencil to label three 250 mL beakers, 1st, 2nd, and 3rd. Label the 600 mL beaker as 4th.
2. Use a pipette to add 25 drops of the universal indicator into the 1st 250-mL beaker, and then use the graduated cylinder to add 200 mL of DI water to this beaker.
3. Obtain a full pipette of vinegar by squeezing the bulb and then releasing the bulb when the pipette is in the vinegar; note that the pipette will not be completely full. Add the vinegar to the 2nd 250-mL beaker.
4. Obtain a full pipette of ammonia (ideally the same amount in the pipette as compared to the vinegar you obtained in the previous step), and add the ammonia to the 3rd 250-mL beaker.
5. Use the graduated to add 100 mL of vinegar to the 600 mL beaker; this is your 4th beaker.
6. Now it is time to pour.
 - a. Slowly pour the contents from the 1st beaker into the 2nd beaker, swirl the contents around to mix, and record the color that results in your *changing colors* data table.
 - b. Pour contents from the 2nd beaker into the 3rd beaker, swirl the contents around to mix, and record the color that results.
 - c. Pour contents from the 3rd beaker into the 4th beaker, swirl the contents around to mix, and record the color that results.
7. Use the color to analyze whether the contents were acidic or basic, for each pour. Record your answers.

Clean-up

- Pour all liquids down the sink and thoroughly flush sink with water
- Discard all used pipettes in the trash
- Thoroughly wash and dry all beakers
- Thoroughly wash graduated cylinder and place on drying rack to air dry

Looks like Kool-Aid

8. Draw a table in which to record your observations. Read the instructions for obtaining the data.

Table 43.4.2: Looks like Kool-Aid

Stage of Experiment	Color	Basic (yes or no)
4 Beakers		
5 Beakers		

9. Use the grease pencil to label your 250 mL beakers, 1st, 2nd, 3rd, 4th and 5th.
10. Obtain and add exactly 1/8th teaspoon of sodium carbonate into the 1st 250 mL beaker. Use a pipette to add enough DI water to make a paste; use the plastic spoon to mix the water and sodium carbonate until the sodium carbonate is somewhat dissolved and you have a paste like consistency.
11. Use another pipette to add 6 drops of phenolphthalein solution to the 2nd 250 mL beaker.
12. Add 3 full pipettes of vinegar to the 3rd 250 mL beaker
13. Obtain 500 mL of DI water in the 600 mL beaker.
14. Now it is time to pour.
 - a. Pour 100 mL of the DI water into each 250 mL beaker, from the 600 mL beaker.
 - b. Pour the contents, in order, from the beakers labeled 1st, 2nd, 4th, and 5th into the 600 mL beaker, then pour the liquid from the 600 mL beaker back into the 1st, 2nd, 4th, and 5th beakers, filling each to the 100 mL line.
 - c. Record the color of the liquid in the four beakers, in your *Looks like Kool-Aid* table; this is the “4 beakers” stage of the experiment.
15. Now it is time to pour for the next stage of the experiment.
 - a. Pour the contents, in order, from all five 250 mL beakers labeled 1st, 2nd, 3rd, 4th, and 5th into the 600 mL beaker, then pour the liquid from the 600 mL beaker back into the five 250 mL beakers, filling each to the 100 mL line.
 - b. Record the color of the liquid in the five beakers, in your *Looks like Kool-Aid* table; this is the “5 beakers” stage of the experiment.
16. Use the color to determine in which stage(s) the liquid was basic. Record your answers

Clean-up

- Pour all liquids down the sink and thoroughly flush sink with water
- **Discard all used pipettes in the trash**
- **Thoroughly wash and completely dry all beakers**
- **Clean your laboratory table top**

Invisible Ink

18. Obtain 10 mL of phenolphthalein solution in a clean 100 mL beaker.
19. Dip a Q-tip into the phenolphthalein solution and use it to write a message or make a sketch on your sheet of white paper. Allow your message or sketch to completely dry.
20. After your message or sketch is completely dry, spray the paper with regular formula Windex (or ammonia). Record the color of your message or sketch. Use the color to analyze whether the message/sketch became acidic or basic when sprayed with the Windex. Record your assessment of whether the color indicates an acid or a base.

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