

# Purple Cabbage

(*Brassica oleracea* var. *capitata* f. *rubra*)

## Ph indicator

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## **Abstract**

This experiment is dedicated to finding out whether different amount of a solution added to anthocyanin dye found in purple cabbage affects the change in color that indicates the Ph measurement. However, a conclusion could not be made since there were problems that needed to be addressed in the study. Moreover, more study should be made to provide more evidence to whether reject or accept the hypothesis.

## **Introduction**

Purple cabbage are known to be eaten all across the globe. They can be used in salad, pickle, and braise. Aside from their use for consumption, purple cabbage are also known for their anthocyanin which is a pigment that give them their color coating. This pigment changes color based on the Ph of the solution it is exposed to, thus was used in a lot of studies for Ph testing including this one. This experiment is aimed to find out whether different amount of a solution added to anthocyanin dye found in purple cabbage affects the change in color. It predicted that there would not be a color difference when different volume of a solution is added into the Ph indicator solution because through common sense the amount of a solution should not affect its Ph reading.

## **Material needed and Lab procedure**

Materials that were needed in this experiment are as follow:

- one cabbage
- one knife
- one chopping board
- one blender
- one big bowl
- one piece strainer cloth
- 1070 ml of fresh water
- ten 500 ml beaker
- five 100 ml beaker
- two glass stirring rod
- 30 ml of bleach
- 30 ml of Coke
- one teaspoon of powder detergent
- one teaspoon of baking soda
- one lemon

### Preparing the testing solution

To prepare the lemon juice, simply cut the lemon up and squeeze for 30 ml of the juice and store it in a 100 ml beaker discarding the seeds. To prepare the detergent solution, add one teaspoon of detergent into a 100 ml beaker filled with 30 ml of water and stir with glass stirring rod until all the detergent has been dissolved. To prepare the baking soda solution, add one teaspoon of baking soda into a 100 ml beaker filled with 30 ml of water and stir with a glass stirring rod until all the baking soda has been dissolved. To prepare the coke and bleach, simply pour 30 ml of them into their own 100 ml beaker.

### Making the Ph indicator solution

Start by chopping a cabbage into small pieces and blend it with 700 ml of water. Once done, use a strainer cloth to filter for the juice of the cabbage. Then pour 100 ml of the cabbage juice into each of the ten 500 ml beaker then add 50 ml of fresh water into each of them, making a two to one ratio mixture of the cabbage juice and the water. At this stage the mixture in each beaker is ready to be used as the Ph indicator solution. With every two beakers of Ph indicator solution dedicated to testing a testing solution, add 10 ml of a testing solution into one beaker and 20 ml of testing solution into the other and observe the color difference. Repeat this process until all the testing solution has been poured into the Ph indicator solution and make the two beakers that are used to test one solution are placed side by side to better compare the color difference.

### Result

For all the testing solution, the color changes started from bottom and eventually evenly diffuse in the Ph indicator solution. For every testing solution, there wasn't a difference when different amount of testing solution is added into the Ph indicator solution except for the bleach. The color observation for baking soda, Coca Cola, lemon juice, and power detergent were dark blue, pinkish purple, darkish red, and hunter green respectively. For bleach on the other hand, when 10 ml of testing solution was added, the color was observed to be seaweed green, and was observed to be orange when 20 ml of the same testing solution was added in the Ph indicator solution.

Testing solution	Color Observation when 10 ml was added	Color observation when 20 ml was added
Baking Soda	Dark Blue	No color difference
Bleach	Seaweed green	Orange
Coca Cola (Coke)	Pinkish purple	No color difference
Lemon juice	Darkish red	No color difference
Powder Detergent	Hunter green	No color difference

Table 1. Color observation for each testing solution

## Discussion and Conclusion

Although it is true that for most testing solution the color doesn't change, a clear conclusion could not be made since some part of the data supports the hypothesis and some don't. It may also seem tempting to conclude that there is no color difference when different amount of testing solution is added into the indicator solution for all the solution tested except of bleach, but that would not be a valid conclusion. This true for a couple of reasons, (1) further study should be conducted before this conclusion is made, and (2) flaws and errors in the study still need to be identified. The later reason is really important that it needs to be addressed. During, this study many things went wrong. There were a lot of people involved in this study that everything became disorganized especially when was put on the spot to get the lab under a time limit. It is suggested that the observation written down when 10 ml of bleach was added into the indicator solution was a mistake. Then, again this can't be said to be true for sure, thus further studies is needed.

## Literacy Cited

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