



Curiosity Guide #605

Acids and Bases

Accompanies Curious Crew, Season 6, Episode 5 (#605)

Disappearing Ink

Investigation #5

Description

Now you see it! Now you don't! Have fun making some disappearing ink!

Materials

- Ethyl alcohol, also called ethanol
- 3M sodium hydroxide. This substance must be used with gloves, goggles, and adult supervision.
- Gloves
- Safety goggles for each person present
- 2 eye droppers
- Spoon
- Cotton fabric scrap
- Container with lid
- Vinegar
- Cotton Ball
- An adult to supervise

Procedure

- 1) Make sure you have adult supervision.
- 2) Put on safety goggles.
- 3) Measure 90 ml of water and set aside.
- 4) Measure .1 grams of thymolphthalein.
- 5) Dissolve in 10 ml of ethyl alcohol.
- 6) Pour the water into the alcohol mixture.

- 7) What do you notice?
- 8) Put on a pair of gloves. Fill the eyedropper with sodium hydroxide.
- 9) Add drops until the solution changes to a dark blue color.
- 10) Use a different eyedropper and apply the ink onto a cotton fabric scrap.
- 11) Wait several moments. What do you observe?
- 12) Try blowing on the cotton scrap. What do you notice?

My Results

Explanation

Combining the water with the alcohol and the thymolphthalein turns the mixture or solution white because the thymolphthalein doesn't dissolve all the way. The solution turns blue when the sodium hydroxide, a base, is added. This is because thymolphthalein turns blue when it is in the presence of a base. The stain is clearly visible in the cotton fabric. Fabric works better than paper because the fabric is so porous. You have just created ink! At this point, the ink solution has a pH value of 10 to 11.

As the wet spot interacts with the air, the color changes again. This is because the water in the solution mixes with the carbon dioxide in the air and makes a weak carbonic acid. The acid reacts with the sodium hydroxide, neutralizing the sodium hydroxide and forming sodium carbonate. As a result, the dried ink now has a pH value closer to 5 or 6, so the thymolphthalein will go clear again, resulting in disappearing ink!

To speed up the disappearance, a dab of vinegar on a cotton ball will quicken the change. Be sure to store the ink in a sealed container and keep the ink away from your eyes. Stains will wash out with soapy water, and you can safely dispose of the ink down the drain.

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