

The Funny Colors

The Action Mix and prepare 6 test tubes that will dazzle students inquiring about the funny and sudden colour changes, which occur in the test tubes. The idea lies in understanding acids and bases.

Grade Level
Grade 5 – Matter and it's Changes
Grade 6 – Chemicals and Reactions
Grade 9 – Chemistry and You

Materials
6 Test tubes
Test tube rack
Dilute HCl (hydrochloric acid) 1M
Dilute NaOH (Sodium hydroxide solution) 1M
Phenolphthalein indicator
Drinking straw
Medicine dropper
Opaque cup (styrofoam will do)
Water

Instructions Number the test tubes 1-6 to avoid any confusion. Tape a white piece of paper behind the test tube rack for easier distinction of the pink color in the test tubes. Place 3 drops of phenolphthalein in test tube #2 & 4. Then place 1 drop of NaOH in test tube #6 and in the opaque cup. Finally, place 3 drops of HCl in test tube #5. Fill the opaque cup with drinking water, then half fill test tubes #1-4 from the cup (test tube #2 and #4 appear pink). Now pour the contents of test tube #1-4 back into the cup. Now fill test tubes #1-5 (all should be pink except #5). Pour all five test tubes back into the cup, and finally fill test tubes #1-6. Test tube #6 should appear pink. Blow the color away using the drinking straw.

Safety Be careful not to ingest any of the liquid when blowing the colour away from test tube #6, as it contains acids and bases. When disposing of the liquid after the experiment is complete, wash down the sink with plenty of water.

Hints

Science Principle Phenolphthalein is an indicator for basic solutions. It turns pinkish red in dilute NaOH solution or any

other basic solution (with a pH higher than 7). Test tube 5 contains HCl, which will neutralize the base being poured into it. The pH is brought back to lower than 7 and thus turning the liquid colourless.

The air that human beings exhale contains more carbon dioxide than atmospheric air. This gas is slightly acidic in water and neutralizes the weak basic solution. Other substances that can be used to neutralize bases are: vinegar (acetic acid), lemon juice (citric acid), etc.