Water and bubble

Environment, Water

Bubble-ology

Introduction

Everybody loves bubbles! But what makes bubbles form, and float up in the air until they pop? A soap bubble The secret to a good bubble is something called surface tension, an invisible bond that holds water molecules together. Water is a polar molecule, so it has plus and minus ends just like magnets that attract each other. When the water molecules align with each other they stick together, creating surface tension. You might think that it is the surface tension of the water that holds the skin of a bubble together.

Actually, the surface tension of water is too strong to make a bubble. You can try yourself to blow a bubble with plain old water, it just won't work! A good bubble solution has a detergent added to it to relax the surface tension of the water, allowing it to have more elastic, stretchy properties. Now it can act more like the skin of a balloon, stretching out nice and thin, trapping air inside of the bubble like a liquid balloon.

Review of Related

Abstract

Making your own bubble solution is fun, but sometimes the bubbles don't seem to work as well as the solutions you buy in the store.

In this experiment you can test if adding corn syrup or glycerin to your bubble solution will make it just as good as the stuff you can buy. This experiment will have you blowing bubbles! Objective In this experiment you will test if adding glycerin or corn syrup will improve a mixture of bubble solution. Credits Sara Agee, Ph. D. , ScienceBuddies Dawn® is a registered

trademark of Procter & Gamble. All rights reserved. What do you need to make a good bubble solution at home? The basic ingredients are water and detergent.

In this experiment, you will add glycerin or corn syrup to see if they can help you make better bubbles. Which solution will make the biggest bubbles? Which bubbles will last the longest? Terms and Concepts To do this type of experiment you should know what the following terms mean. Have an adult help you search the Internet, or take you to your local library to find out more! Water molecule Polar molecule Surface tension Physical properties Elastic properties Detergent

METHODOLOGY

Materials and Equipment

Glass mason jars with lids (recycled jars work great) Measuring cups and spoons

Distilled Water Liquid dishwashing soap (e. g. Dawn®) Glycerin, small bottle (available at a drugstore or pharmacy) Light corn syrup Pipe cleaners Stopwatch Procedure First, make your bubble solutions, and store them in clearly labeled glass mason jars. Use one jar for each different solution and label with the formula using a permanent marker. Here are three basic solutions to try, but notice that the total volume of the solution is kept consistent: IngredientSolution #1 detergent onlySolution #2 detergent + glycerinSolution #3 detergent + corn syrup Water 1 cup (240 mL) + 1 Tbsp (15 mL) cup (240 mL)1 cup (240 mL) Detergent2 Tbsp (30 mL)2 Tbsp (30 mL)2 Tbsp (30 mL) Glycerin ----- 1 Tbsp (15 mL) ----- Corn Syrup ----- ----- 1 Tbsp (15 mL) Now make a pipe cleaner wand for each solution. Pinch a pipe

cleaner in the middle and give it a kink. Bend one half of the pipe cleaner into a circle and twist together at the center. Repeat with the other two pipe cleaners, and check that all three circles are the same diameter. Go outside and test your bubble solutions. Blow a bubble and catch it on your wand. Immediately start the stopwatch and time how long the bubble lasts.

This will take some practice, so try it out on some extra solution before you start! Repeat the experiment as many times as possible for each solution. Record your data in a data table: Solution #1 - Bubble Time (secs)Solution #2 - Bubble Time (secs)Solution #3 - Bubble Time (secs) Trial 1 Trial 2 . . . . . Trial 20 TOTAL Average Bubble Time in Seconds For each bubble solution, calculate the average time in seconds that the bubbles lasted. Do this calculation by adding up all of the data for a solution, and dividing by the number of trials for that solution.