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Effect of surfactants

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Effect of surfactants

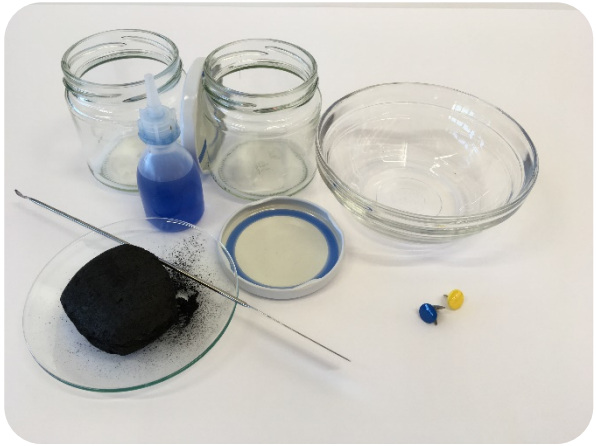
A closer look at surfactants – “**surf**ace **act**ive **a**ge**nts**”

The research question

Oops -– you spilled ketchup on your T-shirt at dinner. And your plate is also very dirty. To wash the T-shirt, you need detergent. And you can use dishwashing detergent to clean the plate. Both cleaning products contain surfactants, also known as cleansing substances. So how do these surfactants work? **What does a surfactant do to the water and the dirt?**

You will need

- Two glass containers with screw caps
- Glass bowl
- A spatula tip of soot (e.g. abrasion from a piece of coal)
- Dishwashing detergent
- Thumbtacks
- Water



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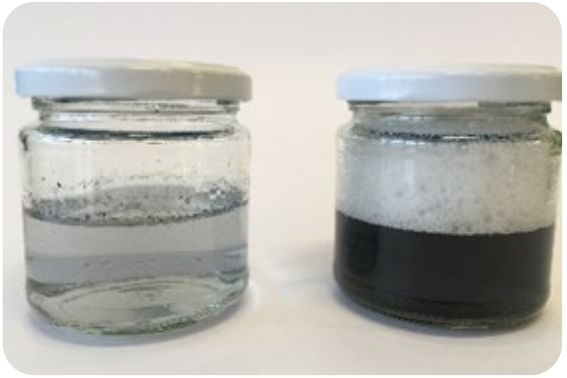
How to do it

Step by step

1. Fill a glass bowl with water and carefully place three thumbtacks flat on the water surface with the tip pointing upwards.
2. Now carefully add 1-2 drops of a dishwashing detergent into the water with a pipette.
3. Observe what happens.



1. Fill two glass jars with screw caps halfway with water.
2. Put a small spatula tip of soot in both glasses with the help of a small spatula.
3. Now use a pipette to drop two drops of a dishwashing detergent into one of the two glasses.
4. Carefully close the jars with the screw caps and shake both jars for about 15 second
5. Place the glasses side by side. What do you observe – what happens with the dirt?

Do your observations help you to answer the research question?

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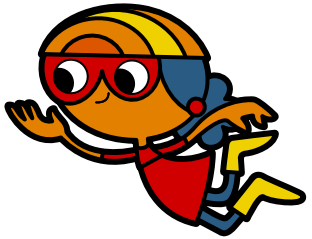
Additional information

For parents and teachers



Context

This lesson is part of a teaching unit about the environmental footprint of a liquid detergent. We begin with a look at a central property of detergents which is due to an important class of ingredients: surfactants. Surfactants are also in dishwashing detergents. They lower the surface tension, help to disperse dirt and remove stains from fabrics.

Surfactants

Surfactants are used to change the surface tension of water to assist cleansing, wetting surfaces, foaming and emulsifying. Surfactants are usually organic compounds that are amphiphilic, meaning they contain both hydrophobic and hydrophilic parts. Therefore, a surfactant contains both a water-insoluble (or oil-soluble) component and a water-soluble component. Surfactants will diffuse in water and adsorb at interfaces between air and water or at the interface between oil and water, in the case where water is mixed with oil.