Fossil Fuels

Investigation Data Sheet

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Alternatives To Fossil Fuels

Fossil fuels are the altered remains of ancient plants and animals. Over millions of years, countless ancient organisms became trapped under mud that piled up, layer upon layer, and pressed down with tremendous pressure. There are three main types of fossil fuels: coal, oil and natural gas, and they are being used up fast. Because of this, people are always searching for alternatives to fossil fuels.

Objective

Fossil fuels, such as petroleum, are being used up fast — even to make plastic. Explore one alternative to using fossil fuels to make plastic by using milk as a source of carbon.

Materials

__ glass beaker
__ a small saucepan
__ food coloring
__ a hot plate
__ a cookie cutter
__ a washable cutting board
__ heavy safety gloves
__ a stirring rod
__ 300 mL of milk
__ 20 mL of white vinegar
__ a sieve or a strainer
__ water
__ an apron or lab coat
__ safety glasses

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. After putting on gloves, an apron and eye protection, pour the milk into the saucepan. Add a few drops of food coloring to the milk and stir it with the rod. This will give our "plastic" its color.
2. Turn on (or have an adult turn on) the hot plate and slowly and carefully warm the milk. Do not heat the milk all the way to boiling.
3. As soon as the milk is heated, have an adult turn off the hot plate. Then, slowly stir the vinegar into the milk. It should begin to clump.
4. Have the adult pour the milk mixture through the sieve or strainer and discard the liquid. What's left in the strainer is your milk plastic. While it is still on the sieve, rinse this plastic with water to wash away any remaining milk and other contaminants.
5. Remove the plastic from the sieve and form it into a shape on your cutting board, using your cookie cutter. Keep the plastic in the cookie cutter for now.
6. Allow your plastic shape to dry. When it has set firmly, remove it from the cookie cutter.

Conclusions

- Compare the plastic you made to other types of plastic. How are they different? (Your plastic will probably appear to be of much lower quality than commercial plastics. It may also break more easily or be more crumbly than some.)

- Do you think that plastic made from milk is a very good substitute for plastic made from fossil fuels? Why or why not?