ChemBam

Carbon for water treatment

AIM

To see whether activated carbon or charcoal are better at removing molecules from water

YOU WILL NEED

- Glass beakers and stirring rods
- Measuring cylinder
- Filter papers and funnel
- Aqueous solutions of various dyes or food colourings (0.001 g per 100 mL)
- Activated carbon
- Crushed charcoal

PROCEDURE

Weigh 1 g of activated carbon into a beaker (make sure you label the beaker). Measure 100 ml of a dye solution into the cylinder and add to the beaker. Stir for 5 minutes and observe any colour loss. You may need to filter the mixture to remove any carbon powder. But beware; some dyes are adsorbed onto filter paper. Repeat this using 1 g of crushed charcoal and compare the two solutions.

Try the same experiment with 0.5 g, 1.5 g and 2 g of activated carbon. Make sure you keep a 'control sample' of the original dye solution so you can compare the colour with your experiments.

Try the same experiment with some different dye solutions.

QUESTIONS

1. Is there a visible difference in the decolouration of the dye solutions between charcoal and activated carbon?
2. How much activated carbon do you need to add to completely remove the colour from the solution?
3. Calculate how many grams of dye can be adsorbed per gram of carbon.
4. Why does activated carbon adsorb dyes? Look up the chemical structure of some of your dyes. What features of the molecules might mean they can be easily adsorbed onto activated carbon?
5. How do different dyes compare? Discuss with your teacher why this might be.