Kitchen chemicals used to grow carbon nanotubes

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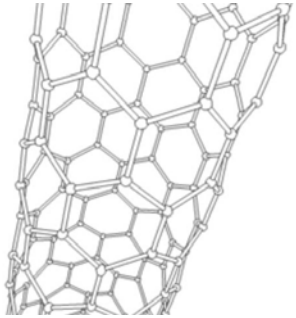

Image source: Schwarzm

Researchers have discovered that cheap compounds found in kitchen cupboards can act as catalysts for the formation of carbon nanotubes. Everyday sodium compounds such as baking soda, detergent and table salt all work.

The process involves dipping carbon fibres in solutions containing sodium chloride, sodium hydroxide or bicarbonate of soda ($NaHCO_3$). The fibres are then exposed to a carbon-containing vapour – in this case a mixture of carbon dioxide and ethyne. The carbon from the vapour attaches to nanoparticles of the sodium to form carbon nanotubes in high yields.

This process allows the nanotubes to be grown at relatively low temperatures compared with other methods – under 400°C. The nanotubes weren't contaminated with sodium, suggesting the catalyst vaporises after the structures have formed.

ROYAL SOCIETY OF CHEMISTRY

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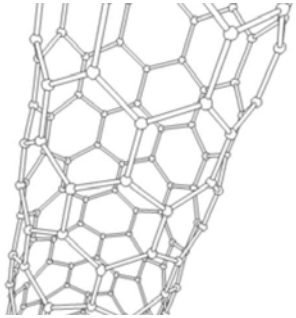

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1. What is a catalyst?
2. Carbon nanotubes are a form (allotrope) of carbon. Name two other forms of carbon.
3. Give one advantage of using a lower temperature in making nanotubes.
4. Explain how carbon nanotubes conduct electricity.