

Alkali sponge fights climate change

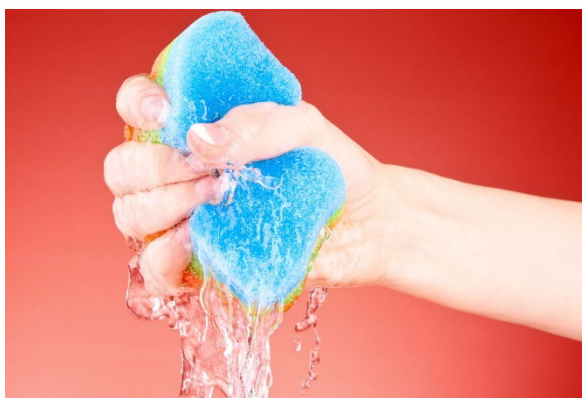
Original article by Fernando Gomollón-Bel. Adapted by Nina Notman.

New carbon capture method uses low-cost charcoal to absorb and release carbon dioxide with the flick of a switch

Charcoal 'sponges' charged with hydroxide ions (OH^-) offer a low-cost, energy-efficient way to capture carbon dioxide directly from air.

The researchers behind the finding decided to explore using activated charcoal for this purpose because it is 'cheap, stable and [already] made at scale'. The material's electrical conductivity also permits a rapid release of captured carbon dioxide, allowing the charcoal sponge to be easily reused.

According to the group leader Alexander Forse, capturing carbon from the atmosphere is a last resort. Still, it is something that needs to be investigated due to the scale of the climate emergency.



Source: © Africa Studio/Shutterstock

Could capturing carbon dioxide with a charcoal sponge be key to helping mitigate climate change?

accumulate in the tiny pores of the activated charcoal. 'The material is then ready to capture carbon dioxide,' says Alexander.

100g of the sponge material soaks up around 1g of carbon dioxide, and it's easy to recycle and reuse the system many times per day. Camille Petit, an expert in porous materials at Imperial College London, says that the rapid regeneration of carbon dioxide is an important breakthrough. She explains that normally heat is needed to release carbon dioxide from these types of materials. In this case, electricity is the trigger, which could lead to significant energy savings.

This is adapted from the article 'Hydroxide-loaded sponge soaks up atmospheric carbon dioxide' in *Chemistry World*. Read the full article at rsc.li/4dhcOel.

Hydroxide-charged charcoal

The research team took the less explored route of using hydroxide ions to bind carbon dioxide. 'It's very rapid, and more efficient than other methods,' says Alexander. The secret is 'sticking' the hydroxide ions inside the porous (spongy) structure of activated charcoal. The chemists devised a battery-like charging process to stick hydroxide ions inside the charcoal sponge. They use charcoal sponge electrodes and an electrolyte that is full of hydroxide ions. When they apply a voltage, the hydroxide ions