

Today's Solutions: April 11, 2021

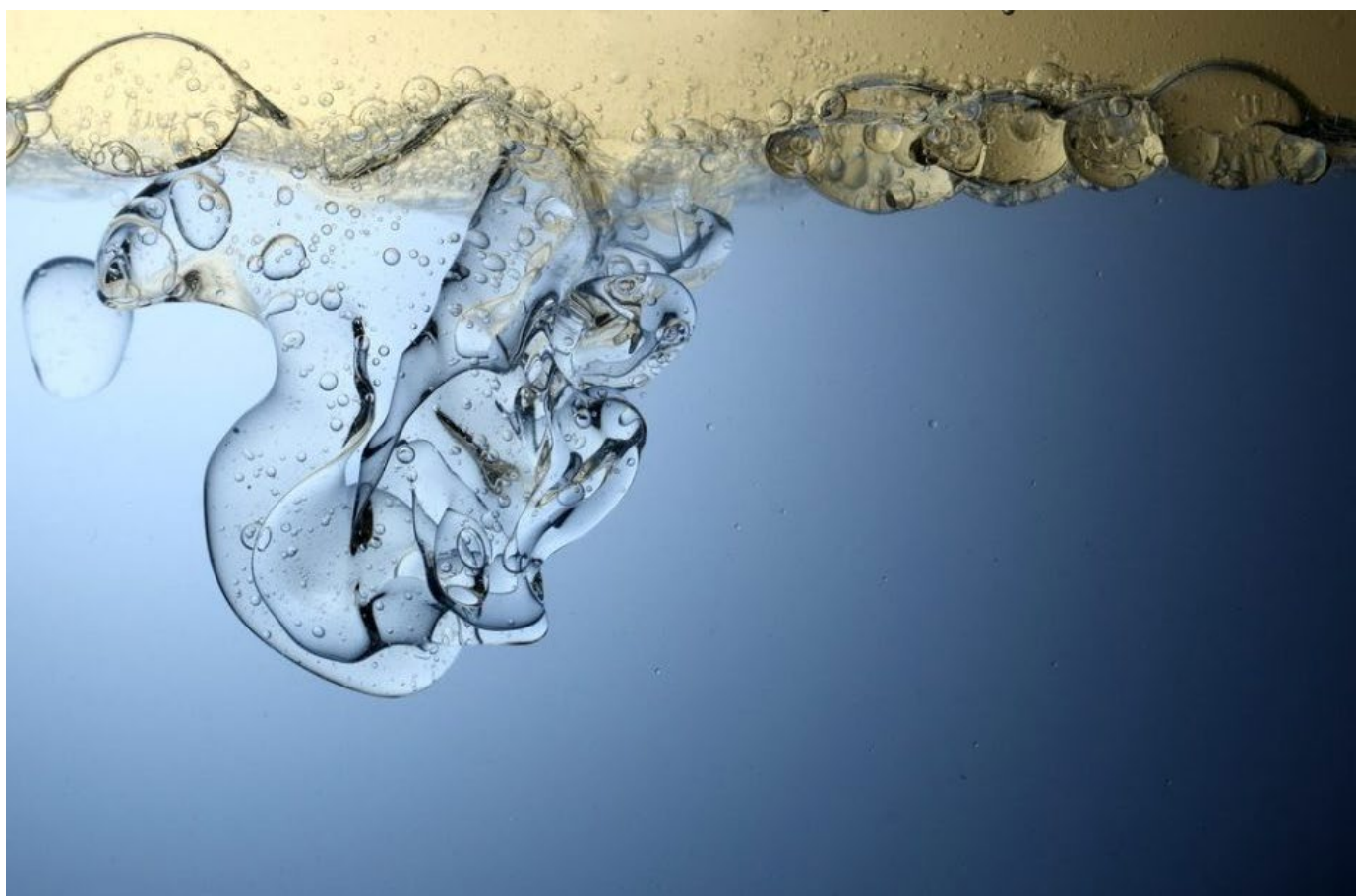
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This reusable and biodegradable sponge can help clean up oil spills

April 10, 2021 in Innovation



Most of the materials designed for removing oil spills from water are single-use, meaning that they're bound to eventually end up in landfills. We've written about the potential to use **shed dog fur** for oil spill cleanups, and now, scientists have developed an oil-absorbing sponge that can be used multiple times and eventually biodegrade.

Created by a team from Singapore's Nanyang Technological University (NTU) and South Korea's Sungkyunkwan University, the novel material is made of plant pollen and it requires a similar production process to that of making soap.

For the process, the researchers collected pollen grains from sunflowers, which were already covered with a sticky oil-based substance. That substance was then separated from the grains by submerging the pollen in alkaline conditions for three days.

The remaining gel-like substance was then freeze-dried to form a porous material, which was subsequently heated to 392 °F to stabilize it. The final step involved coating the material with a layer of stearic acid — a fatty acid found in vegetable and animal fat.

In addition to being porous, the resulting material has hydrophobic properties. This means that, if placed in oil-polluted water, the sponge would only soak up the oil and leave the water behind.

When tested, the new sponge exhibited similar absorption qualities to commercially available plastic-based absorbents. However, in contrast to its petroleum-based counterparts, the sponge is entirely made of renewable materials that biodegrade once discarded — which would only happen after it has been reused.

“By fine-tuning the material properties of pollen, our team successfully developed a sponge that can selectively target oil in contaminated water sources and absorb it,” said **study** lead author, Prof. Cho Nam-Joon. “Using a material that is found abundantly in nature also makes the sponge affordable, biodegradable, and eco-friendly.”