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A LAMPSHADE COATING IMPROVES INDOOR AIR QUALITY



ARCHITECTURE & DESIGN

Researchers have designed lampshades that transform indoor air pollutants into harmless compounds

Spotted: Air pollution is not only outdoors, pollutants can also be released from building materials, furnishings, products like air fresheners, and even from cleaning or redecorating. To tackle the issue, scientists have designed catalyst-coated lampshades that transform indoor air pollutants into harmless compounds.

According to the project's principal investigator, Dr. Hyoung-il Kim, the shades target volatile organic compounds (VOC), including acetaldehyde and formaldehyde, which account for most indoor pollutants. These compounds are released by everyday objects and activities, including paints, cleaners, air fresheners, plastics, furniture, and cooking.

Traditional methods to remove VOCs require periodic replacement or additional equipment. Kim's team aims to take a simpler approach by only using a visible light source that produces heat – like lightbulbs – and a lampshade coated with a thermocatalyst.

The team coated the inside of an aluminium lampshade with the catalyst, and placed the shade over a 100-watt halogen bulb in a test chamber containing air and acetaldehyde gas. The shade was heated to 250 degrees Fahrenheit when turned on – warm enough to activate the catalyst. The VOC was completely oxidised and converted into a harmless amount of carbon dioxide and water. The proposed thermostatic system offers a sustainable and viable method that does not need any additional technology.

The researchers presented their results at the American Chemical Society's (ACS) fall meeting. Kim's group is turning to less expensive substitutes for the thermocatalyst, which was initially made using

and platinum, and is also finding ways to extend the concept to LEDs and develop a that can utilise all light sources, including UV and visible light, as well as waste heat.

As the world gets more and more industrialised, so does the level of air pollution in the atmosphere. The desire to reduce air pollution has spurred many innovations, and in the archive Springwise has also spotted [science-based monitoring](#) to tackle air pollution in India and [light-sensitive concrete](#) that cleans the air in road tunnels.

Written By: Anam Alam

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Email: HI.KIM@YONSEI.AC.KR

Website: yonsei.ac.kr

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Takeaway:

On average, Americans spend almost [90 per cent](#) of their time indoors, where the concentrations of some pollutants can be up to five times higher than outdoors. Indoor air pollution is also a huge health problem. It can irritate your eyes, nose, and throat, trigger headaches and fatigue, and cause more severe health issues like respiratory diseases, heart disease, and cancer. It's particularly a problem for those living in developing countries, who often lack access to clean cooking fuels. The new lampshade coating provides an eco-friendly and simple alternative to removing these pollutants, protecting our health and the environment.