Lotus leaf inspires fog-free finish for transparent surfaces

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Chinese scientists use silica nanoparticles resembling raspberries to create a water-repellent, fog-free, self-cleaning finish for glass and other transparent surfaces.

Inspired by the water-repellent properties of the lotus leaf, a group of scientists in China has discovered a way to impart a fog-free, self-cleaning finish to glass and other transparent materials. "Superhydrophobic" surfaces, such as the lotus leaf, are excellent at repelling water and also boast other "smart" self-cleaning, anti-glare, anti-icing, and anti-corrosion properties. By using hollow silica nanoparticles that resemble raspberries, scientists at the Chinese Academy of Sciences were able to apply a clear, slick, water-repellent surface to glass.

This is significant in material fields because it means that after modifying low-surface-energy materials and creating surface textures on them, surfaces can be made to exhibit completely different wetting characteristics – either repelling or attracting moisture. As described by the scientists in the American Institute of Physics (AIP) journal *Applied Physics Letters*, these surfaces show good anti-fogging and light transmittance properties before and after chemical modification, which should help pave the way to a clearer, fog-free performance for windshields, windows, solar cells and panels, LEDs, and even TVs, tablets, and cell phone screens. Smart surface coatings are highly desirable, especially for solar cells and panels, which frequently lose up to 40 percent of their efficiency to dust and dirt buildup within a year of installation. The next challenge the scientists face is figuring out how to

move the smart surfaces from the lab to industry in a cost-efficient manner.

More information: "Transparent superhydrophobic/superhydrophilic coatings for self-cleaning and anti-fogging," is published in *Applied Physics Letters*. apl.aip.org/resource/1/applab/v101/i3/p033701_s1

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