New nanostructure technology provides advances in eyeglass, solar energy performance

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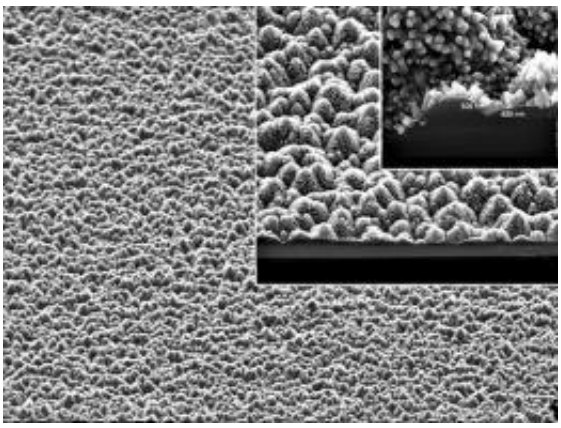

Chemical engineers at Oregon State University are using extraordinarily small films at the nanostructure level to improve the performance of eyeglasses and, ultimately, solar energy devices. These films, which resemble millions of tiny pyramids, reduce the reflectance of any light that strikes the material. (Image by Seung-Yeol Han)

(PhysOrg.com) -- Chemical engineers at Oregon State University have invented a new technology to deposit "nanostructure films" on various surfaces, which may first find use as coatings for eyeglasses that cost less and work better.

Ultimately, the technique may provide a way to make solar cells more efficiently produce energy.

The films reduce the reflectance of light, and in the case of eyeglasses would capture more light, reduce glare and also reduce exposure to ultraviolet light. Some coatings with these features are already available, but the new technology should perform better at a lower cost, and be able to be applied on-site in a dispenser's office.

"There's really a whole range of things this technology may ultimately be useful for," said Chih-hung Chang, an associate professor in the OSU Department of Chemical, Biological and Environmental Engineering. "They should be able to make almost any type of solar energy system work more efficiently, and ultimately could be used in cameras or other types of lenses."

A patent has been applied for on the new technology, and the first commercial products may be ready within a year, Chang said.

The key to the process is use of a chemical bath, controlled by a microreactor, to place thin-film deposits on various substrates such as glass, plastic, silicon or aluminum. In this case, the technology will create a type of nanostructure that resembles millions of tiny pyramids in a small space, which function to reduce the reflectance of any light that strikes the material.

The scientists are now working on the application of this thin film to polycarbonate, the type of plastic most commonly used in eyeglass production, and also plan to create a small unit that can apply the films inexpensively in an office setting.

The final product should be faster to apply, less costly, reduce waste of materials and perform better than existing technologies, the researchers said.

Provided by Oregon State University (news : web)