Natural solar collectors on butterfly wings inspire more powerful solar cells

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Close-up of the scales of a butterfly wing. These scales have inspired more powerful solar cells. Credit: Michael Apel, Wikipedia Commons

The discovery that butterfly wings have scales that act as tiny solar collectors has led scientists in China and Japan to design a more efficient solar cell that could be used for powering homes, businesses, and other applications in the future. Their study appeared in the Jan. 13 issue of ACS' *Chemistry of Materials*.

In the study, Di Zhang and colleagues note that scientists are searching for new materials to improve light-harvesting in so-called dye-sensitized solar cells, also known as Grätzel cells for inventor Michael Grätzel. These cells have the highest light-conversion efficiencies among all solar cells — as high as 10 percent.

The researchers turned to the microscopic solar scales on butterfly wings in their search for improvements. Using natural butterfly wings as a mold or template, they made copies of the solar collectors and transferred those light-harvesting structures to Grätzel cells. Laboratory tests showed that the butterfly wing solar collector absorbed light more efficiently than conventional dye-sensitized cells. The fabrication process is simpler and faster than other methods, and could be used to manufacture other commercially valuable devices, the researchers say.

Article: "Novel Photoanode Structure Templated from Butterfly Wing Scales", *Chemistry of Materials*

Provided by ACS