

Unique Photovoltaic Cells Are Flexible, Lightweight, And Made From Plastic

University of Massachusetts Lowell



Conventional photovoltaic solar cells are rigid, glass-based, and generally expensive to manufacture—until now. Scientists at the University of Massachusetts' Center for Advanced Materials in Lowell have invented a low-temperature manufacturing process for dye-sensitized, titaniumdioxide photovoltaic cells on a flexible polymeric film.

This unique photovoltaic cell technology was developed from 1999 to 2001 by Sukant Tripathy, K.G. Chittibabu, Jayant Kumar, Lynne Samuelson, Lian Li, and Srinu Balasubramanian. Funding for the initial research was provided by the U.S. Army.

“ A flexible plastic film containing dyes and paint pigments is used to produce electricity. Utilizing this technology, it is now possible, for the first time, to use a variety of low-cost polymers as the top and bottom surfaces of photovoltaic cells.

These cells can generate electricity from more light sources than just sunlight, including indoor lighting. The light energy is transmitted via the electrically active materials and a series of electrodes to create electricity. The film is produced in a continuous roll-to-roll process that is less expensive and less capital-intensive than the more complex, time-consuming assembly of traditional solar cells. A few of the abundant industrial applications are handheld electronics, sensor networks, textiles, military equipment and roofing materials.

The University of Massachusetts and private sources provided the funding necessary to launch a spin-off company to commercialize the technology. Established in Lowell in 2001, Konarka is conducting additional research and development on this innovative photovoltaic cell design. Investments in Konarka exceed \$100 million to date.

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