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Windows Generate Electricity through Transparent Solar Cells

Solar Power is the energy generated by sunlight. This use of energy produces no waste and does not give out any harmful emissions. Also, it does not put strain on the Earth's ecosystem by using up too much land space, as it requires minimal machinery to operate.

There have been new developments in the solar industry. The new transparent solar cell was developed. This transparent solar cell will enable buildings to produce electricity while at the same time allowing people to look through windows of their homes.

The polymer solar cells (PSCs) made out of materials similar to plastic. These polymer solar cells are flexible without being bulky and have a very light weight. They can be produced at mass volumes with very little cost.

Polymer solar cells include organic solar cells (also called "plastic solar cells"). They are one type of thin film solar cell, others include the currently more stable amorphous silicon solar cell.

The disadvantages of polymer solar cells are also serious: they offer about 1/3 of the efficiency of hard materials, and they are relatively unstable toward photochemical degradation.

By using high-performance, solution-processed, visibly transparent polymer solar cells and incorporating near-infrared light-sensitive polymer and silver nanowire composite films as the top transparent electrode. It was found that the near-infrared photoactive polymer absorbed more near-infrared light but was less sensitive to visible light. This, in essence, created a perfect balance between solar cell performance and transparency in the visible wavelength region.

The new PSCs make use of only infrared light and not visible light to generate energy. This feature makes the cells transparent to 66% to the human eye. These cells are made from a photo-active plastic. The photo-active plastic produces an electric current through infrared lights.

A key development is the transparent conductor that is made from a blend of silver nano-wire and titanium dioxide nano-particles. This conductor is used to replace the opaque metal electrode that was used in the past. This metal electrode makes it possible for the solar cells to be produced economically through solution processing. These cells could even be further used in smart windows and other portable electronic devices.