15 Aug 2023

The new solar cell more sustainable than lead

TECHNOLOGY Thomas World about 6 hours ago REPORT

The world of sustainability is constantly evolving and here comes Perovskite, the solar cell that changes the world of panels. But why is this discovery so important? And what change does this material entail?

Modern times have allowed us to make gods amazing steps forward and also interesting in terms of sustainability and respect for the environment. Indeed, there is a plurality of shocking solutions never seen before, which however could prove to be the turning point, changing our lifestyle approach to the surrounding world reminding us that we have only one planet and that we must respect it on a daily basis.

Sustainable solutions are today the only response to the climate crisis which is highly influencing the status of nature and of the human being himself. Exactly for this reason companies and researchers are committed every day to find the best solutions, able to satisfy the ever higher demand.

The latest discovery plans to replace the main material of the panels. This solution could prove to be one of the most ingenious in terms of renewable and clean energy supply. This should therefore allow us to perform the most important activities of our daily life but impacting as little as possible on the surrounding world.

Perovskite: the new solution

The protagonist of this revolutionary idea is the perovskite and, a material naturally ferroelectric. Meaning what capable of interacting with light without requiring any kind of modification. This is potentially applicable for the construction of new solar cells produced in tandem with silicon or as the only material.

Scientists have used a numerical form and software capability of SCAPS-1D solar cells, a simulation tool created specifically for thin-film solar cells. The idea took shape and developed in Belgiansor, precisely from Ghent University. This is to simulate a solar cell using ETL. Based on C61 butyric acid phenyl methyl ester.

For the creation of this tool scientists have optimized defect concentration of layers and interfaces, the thickness of the layers, the shunt and the resistance in series of the device. The results obtained showed that the device can achieve a conversion efficiency of 10.83% and a fill factor of 80.8%. It also turns out perfectly also capable of reaching a no-load voltage of 0.76788 V together with a short-circuit current of 17.44 879 mA/cm2.

Less and less toxic

There construction of this cell was based on use of this material but without using the lead cover layer. In fact, although it is normally necessary to protect the module, this in case of breakage or damage would cause a dispersion of heavy metal in the environment thus resulting incredibly polluting.

The research by the NTU and Singapore's Science, Technology and Research Agency it was indeed initially focused on creating a cover layer that did not necessarily use lead but rather more sustainable materials and the least possible impact.

Starting from this objective it was therefore presented a simulation of solar cell whose effectiveness was 10.83%, e based on the use of perovskite, also called with the name of KAnl3 and which is perfectly lead first, therefore consistent with the final scoop. It might be interesting to specify that this material actually is known for some time in the field of solar energy production renewable but what only in recent times has it been employed in the indian university for the creation of a solar module.

Perovskite: pictures and photos

The new material that makes up the photovoltaic panels could be the turning point for sustainability. Lighter and more malleable, it also guarantees greater sealing and better recyclability.

https://news.italy24.press/technology/778506.html