



15 Aug 2023

The new solar cell more sustainable than lead

Italian translation

TECNOLOGIA Emma [Internazionale](#) [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 incredible and also interesting steps forward 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 answer to the climate crisis which is strongly influencing the state of nature and of human beings themselves. Precisely for this reason, companies and researchers are committed every day to find the best solutions, capable of satisfying the ever-increasing 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 carry out the most important activities of our daily lives but with the least possible impact on the surrounding world.

Perovskite: the new solution

The protagonist of this revolutionary idea is perovskite, a naturally ferroelectric material, which means something capable of interacting with light without requiring any kind of modification. This is potentially applicable for building new solar cells produced in tandem with silicon or as the sole material.

Scientists used the numerical form and capabilities of SCAPS-1D solar cell software, a simulation tool specifically created for thin-film solar cells. The idea took shape and developed in Belgium, precisely from the University of Ghent. 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 the concentration of the level and interface defects, the thickness of the layers, the shunt and the series resistance 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 is also perfectly 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

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

Research by NTU and Singapore's Agency for Science, Technology and Research was really initially focused on creating a roofing layer that didn't necessarily use lead but rather more sustainable materials and as little impact as possible.

Starting from this objective, a simulation of the solar cell was then presented, the efficacy of which was 10.83%, and based on the use of perovskite, also called by the name of KAnI_3 and which is perfectly lead free, therefore consistent with the final scoop. It might be interesting to specify that this material has actually been known for some time in the field of renewable solar energy production but that it has only recently been used in the Indian university for the construction 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://it.italy24.press/tecnologia/604778.html>