Semi-Transparent Perovskite Solar Cell

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Semi-Transparent Perovskite Solar Cell Latest News

Recently, the IIT Bombay researchers have developed a semi-transparent perovskite solar cell (PSC).

About Semi-Transparent Perovskite Solar Cell

- It is layered over a **traditional silicon-based solar cell**, forming a 4**-terminal (4T) tandem structure.**
- **Material used:** The bottom sub-cell uses well-established **silicon technology**, while the top sub-cell features an indigenously developed **halide perovskite semiconductor**, enabling high light absorption and efficient energy conversion.
- This helps in power **conversion efficiency** of approximately 30 per cent compared with around 20 per cent now.

    - Halide perovskite is among the most efficient light-absorbing materials known today. Apart from being highly efficient in converting light into electricity, it is affordable as electronic grade perovskite semiconductors can be produced locally with available chemical resources.
- Perovskite Solar Cells are a type of **photovoltaic (PV) technology** that uses crystal structures called perovskites for converting sunlight into electricity.
- These crystals share the structure of the **mineral calcium titanium oxide ($CaTiO_3$)** and can be engineered to possess a wide range of optical, electrical, and semiconducting properties.
- The general chemical formula of a perovskite compound is ABX_3, where ‘A’ and ‘B’ are cations, and ‘X’ is an anion.
- They offer high **power conversion efficiencies** at a lower cost than traditional silicon-based PVs, but they suffer from shorter **lifespan and stability issues.**

Semi-Transparent Perovskite Solar Cell FAQs

Q1: What is the lifespan of a perovskite solar cell?

Ans: At least 20 years.

Q2: What is Perovskite?

Ans: Perovskite refers to materials with the crystal structure of calcium titanium oxide ($CaTiO_3$), discovered in 1839 in Russia. The general formula is ABX_3, where ‘A’ and ‘B’ are cations and ‘X’ is an anion.

Source: IE

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