Application of solar energy - SOLAR CELL

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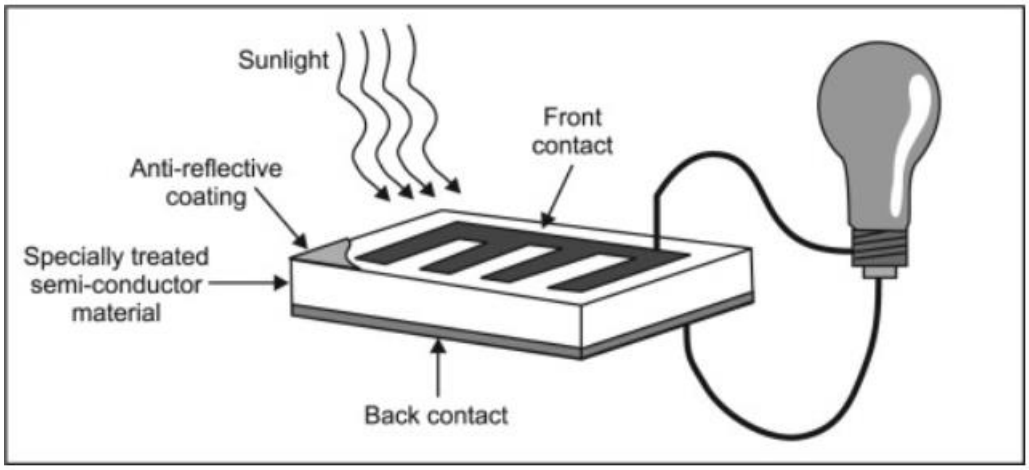
SOLAR CELL

INTRODUCTION

- Solar cells are semi-conductor devices which produce electricity by using sunlight. They directly convert light energy into electrical energy through the **photovoltaic effect**.
- Solar cells use photo detectors to detect radiation of measuring light intensity.
- Direct voltage generates when light strikes between junction of a metal and semiconductor (like silicon) or junction of two different semiconductors.

STRUCTURE



- To connect each solar cell to another, wafers of silicon are doped, and electrical contacts are used.
- These form silicon disks which are given an anti-reflective coating.
- This coating helps in protecting from sunlight loss. The solar cells are then encapsulated and placed in an aluminium frame.
- The process is continuously monitored to have a surety of quality.
- After the manufacturing process is complete, they undergo final test to check their efficiency under normal conditions.

ADVANTAGES

- Renewable energy source: It does not generate emissions or radiations. Hence it is not harmful to the environment.
- Reduced electricity bills and low maintenance: It is very cost effective as it is a one-time expense and long lasting.

- Lifetime: Solar cells have longer life, about 30 years.
- Better technology: It is very easy to operate compared to other power sources of re-new able type.

DISADVANTAGES

- Depends on the weather: It cannot be used in absence of the light from any source. During cloudy weather, less power is being generated.
- Expensive to setup: It incurs very high initial cost for installation.
- Requires a lot of area: Very large geographical area is needed to deploy solar panels or cells. Off grid applications require energy storage.
- Photo-Voltaic solar cells generate direct current (DC). It requires DC appliances or inverters (to convert DC to AC) for use with solar cells-based plants.
  Manufacturing is not completely free of pollution: Some hazardous materials are used during the manufacture of these solar cells which sometimes harm the environment.

REFERENCES

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