Chapter
5

DYE SENSITIZED SOLAR CELLS – HISTORY AND RECENT DEVELOPMENTS

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Introduction

Industrialisation is happening at a rapid rate and results in demand for more energy(1). The procedure of industrialisation leads to consumption of fossil fuels such as coal and petroleum. Not only fossil fuels are primary sources of energy production, but exhausting the resources quickly. There is increasing demand for clean energy to overcome the pollution and greenhouse gases which is causing troubles to nature and human mankind. Tapping of sunlight into energy could be the major source of energy generation which is available in abundance and free of cost. Photovoltaic (PV) cells convert the incident light into electrical power. The important silent feature of PV solar cells are pollution and noise free and clean energy. With PV technology, the energy can generate from few kWs to MWs by the establishment of solar panels on open land or roof tops of building with facing the panels to Sun light with a desired inclination. It is estimated that 0.3 percent of land covered by solar panels can fulfil the demand for energy for all countries. In the wake of depleting fossil fuel reserves, photovoltaic cells have a very important role to play.

Background History

The photovoltaic effect was discovered by Alexandre Edmond Becquerel, a French physicist using metal electrodes and electrolyte in 1839. While testing the flaws in trans-Atlantic telegraph cables in 1873, Willoughby Smith discovered photoconductivity in selenium. Based on this concept, first solar cell was built to demonstrate the photoelectric effect with selenium sandwiched between platinum contacts by William Grylls Adams and his student Richard Evans Day. With selenium and gold, the first working solar cell with an efficiency of 1% was

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