

Development of Highly Efficient Dye-sensitized solar cells

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A recent analysis has shown that the conversion of solar energy into electricity by solar cells is one of the most promising renewable energy technologies. Presently, silicon solar cell has occupied a promising position in the market owing to plenty availability of the basic raw materials. However, the cost is still a forbidding factor, that is standing in the way of wide spread applications. Hence, the development of alternative at affordable cost is necessary. The dye-sensitized solar cell is being very intensively investigated as a potential photovoltaic cell. Dye-sensitized solar cells currently convert about 13 percent of the sunlight which hits them into electricity. The researchers are trying to make these solar cells at least as efficient as their silicon counterparts that currently convert about twice as much radiation as the dye-sensitized solar cells. Despite this relatively low-efficiency, dye-sensitized solar cells have several advantages over silicon cells. Dye-sensitized solar cells could be fabricated using low-cost materials, which makes them attractive for mainstream use. In this direction, dye-sensitized solar cells can become viable proposition. The performance of this type of solar cells depends on the semiconductor material, morphology, structure of the sensitizing molecules and redox mediator used. In this study, we report a widely applicable and relatively simple approach for the successful preparation of one-dimensional semiconductor oxide thin films. Further, the promising applications of this one-dimensional nanostructured material in DSSC will also be discussed.