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Recent Developments in Cobalt Electrolyte for Dye-Sensitized Solar Cells, a mini review

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ABSTRACT

Increasing population, urbanization, industry development and indiscriminate use of natural resources has opened a new era of research among scientists. Among all of the renewable energies, solar power would be a smart choice. In the last fifteen years scientist have been able to achieve significant results in solar cell field. There is several visions to increase the efficiency of solar cells, but in this review we are focused on electrolyte redox mediators specifically cobalt complexes due to their distinctive features and valuable impacts that could have accelerate the process in this research area.

Keywords: Electrolyte, Solar Cell, Cobalt

1. INTRODUCTION

There is now crucial obligations to going on to hoard the common source of energy such as oil.[1] During the twentieth century wasteful exploitation of fuels due to rapid human population growth leading to depletion of reserves and in the late twentieth century nations was looking to tap renewable energy sources such as wind, tidal, geothermal, biogas and solar.

Among these type of energy, solar energy is considered to be the best option for the modern world. Used as an alternative to petrol, the solar power doesn't pollute the environment and delivers clean and reliable energy to the customers and obviously it doesn't emit harmful carbonic gases into the atmosphere around the earth. As a result, people could assure electrical supply to their homes without any pollutions. Moreover, the customers do not have to grapple with the storage issues related to fossil and nuclear fuel. Solar panels also do not make noise and emit toxic fumes into the atmosphere of earth.

A solar cell, or photovoltaic cell (previously referred to "solar battery"), is an electrical device that converts the energy of light into electricity. It is a form of photoelectric cell, construed as a device whose electrical characteristics, such as current, voltage, resistance and vary when exposed to light. Solar cells are the building blocks of photovoltaic units, otherwise known as solar panels.

In mid-twentieth century, 1954, Chapin et al. at Bell Lab did a research on direct conversion of solar radiation into electrical power which the photocells have been made to deliver power from the sun into a resistance load at the rate of 60 watts per square meter of photocell surface. Chapin demonstrated the first crystalline silicon p-n junctions solar cell with approximately 6% efficiency.[2] Researchers achieve new conversion on silicon solar cell after decades up to 25% on crystalline silicon and 27% on single cells.[3] the next generation of solar cells are compound films, such as Indium phosphide (InP, efficiency ≈ 22%) and cadmium telluride (CdTe, efficiency ≈