Acquisition of Low Cost Energy by Natural Dyes with Dye Sensitized Solar Cells (DSSC)

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Nowadays, the vast majority of rapidly increasing energy needs is supplied from fossil fuels. As a result, our world is being exposed to global warming each day. The best way to prevent these problems is solar energy. Every year our world surface takes energy from the sun fifteen thousand times more than annual energy consumption. The aim of this study is to increase the individual uses of solar energy by reducing the cost of photovoltaics. Solar cells are divided into first, second and third generation solar cells. The cheapest of these panels is the third generation solar panels ($/Watt). In this study, third generation solar panels were used with DSSCs. DSSC is photovoltaics sensitized by dye mimicking photosynthesis. DSSC have many advantages such as low radiation conditions, low cost and more. At the same time, because of its flexible structure, its usage areas are much wider. In this study, dyes that extracted from 11 different plants were used. Extraction of these dyes was done separately in ethanol and water. Then, mixture dyes and pure stains were tried. For better interpretation of the results, solar cell was made by N719. The efficiency of N719 is 2.47%. The best efficiency among the natural dyes was ethanol extract of Delphinium semibarbatum B. plant with 0.73%, followed by Reseda luteola with an efficiency of 0.68%. UV, IV and IPCE measurements are also added in the report. As a result, it has been determined that Delphinium semibarbatum B. extract can be a cheaper alternative to Ruthenium dyes which are expensive in DSSCs. And it is aimed to increase the individual use in this respect. Panels produced can be integrated into many places such as clothes, phones, homes windows and global warming can be prevented by increasing the use of solar energy.

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