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## Fabrication of titanium dioxide-based sensitized solar cell using black grapes

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A dye sensitized solar cell converts visible light into electricity using sensitization of the cell. Performance of dye sensitized solar cells is mainly based on the dye used as the sensitizer. Studying the natural dye resources is one of the main concerns of research worldwide. In this research our goal is to study the suitability of black grapes as the sensitizer in dye sensitized solar cells. In the experimental part, the peels of the black grapes were used to extract the dye without mixing with any solvent such as water. The $TiO_2$ coated ITO glasses were heated under different temperature values and they were placed in the dye for different time periods. The best performance of the DSSC with black grapes was obtained with heating the $TiO_2$ coated ITO for 90 minutes to 120 minutes and keeping the glass in the dye for 20 minutes. Naturally extracted dye (without any solvent) gave a better performance than the dye dissolved in water. By emulating the above procedure we have achieved a maximum $V_{oc}$ of 0.370 V and maximum $I_{sc}$ of 0.040mA.

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