

PAPER DETAILS

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ORGANIC DYES FOR TiO₂ DYE-SENSITIZED SOLAR CELLSMücella ÖZBAY KARAKUŞ¹, Tolga ÖNEN², Hidayet ÇETİN^{3*}¹ Bozok University, Engineering and Architecture Faculty, Computer Engineering Department, Yozgat² Bozok University, The Graduate School of Natural and Applied Sciences, Department of Physics, Yozgat^{3*} Bozok University, Art and Science Faculty, Department of Physics, 66200, Yozgat.

Abstract: In this work, we extracted organic dyes from 13 different plants (purple pansy, linden, linden-sage mixture, pink begonia, cehirlik tulip, red beet, anchusa azurea, beet root, mullein, pink peony, red rose, henna, yellow marigold) and 7 fruits (black mulberry, red pepper, eggplant peel, red carrot, malta plum, ink-malta plum, blueberry). These dyes were used as sensitizer for nano-TiO₂ coated FTO dye-solar cell. 20 solar cells were prepared and electrical characteristics were obtained. Solar cells were fabricated as following procedure; TiO₂ paste which was on FTO layer was sintered at 450 °C for 30 min. After the sintering procedure, TiO₂ coated FTO layers were dipped prepared organic-based dyes for 24 h. Platinum coated FTO's were used as counter electrodes. The electrical characterizations of the fabricated solar cells were obtained under 1000 W/m² halogen lamp light. When short circuit current and fill factor values of the cells are compared, the black mulberry dye shows best results with the values of 2.263 A/m² current density and 0.498 fill factor.

Keywords: *Natural Dyes; TiO₂ Nanostructure; Solar Cell.*

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