**THE EFFECT OF ILLUMINATION TIME ON THE DSSC PERFORMANCE PARAMETERS**

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| **ABSTRACT**  It is undeniable fact that energy has a major role in the advancement of science, technology, and civilization. Many studies have been conducted on the creation of clean renewable energy resources as a way to lessen the negative environmental consequences of carbon based fuels and growing global energy demands. Among all the renewable energy sources, solar energy is the most popular because of its abundant supply and minimal impact on the environment. The solar energy system generates electricity from sunlight without emitting any gases that might accelerate global warming. Dye sensitized solar cells (DSSCs), a third generation solar cell, have been a prominent and frequent study topic among the many forms of solar energy studies. The study of dye-sensitized solar cells (DSSCs) has been ongoing for the last thirty years from a number of aspects. One of the shortcoming of DSSCs is the lack of comprehending of how to engineer their different components. The working electrode, mesoporous layer, dye, electrolyte, and platinum coating on counter electrode are a few of the fundamental research items of DSSCs that may be categorized [1-7]. Another factor that affects the performance parameters of solar cells is the production and operating conditions rather than the materials used in their fabrication. One of the operating conditions that has a direct impact on the performance characteristics of the solar cell device is its illumination time under a solar simulator. Here, the effect of illumination duration on the performance metrics of solar cell such the short circuit current density (*JSC*), open circuit voltage (*VOC*), fill factor (FF), and power conversion efficiency (PCE) was investigated and the obtained results were reported.  **References:**  [1] Yildiz, A., Chouki, T., Atli, A., Harb, M., Verbruggen, S. W., Ninakanti, R., & Emin, S. (2021). Efficient iron phosphide catalyst as a counter electrode in dye-sensitized solar cells. *ACS Applied Energy Materials*, *4*(10), 10618-10626.  [2] Sbeta, M., Atilgan, A., Atli, A., & Yildiz, A. (2018). Influence of the spin acceleration time on the properties of ZnO:Ga thin films deposited by sol–gel method. *Journal of Sol-Gel Science and Technology*, *86*, 513-520.  [3] Erdogdu, M., Atilgan, A., Erdogdu, Y., & Yildiz, A. (2024). Flavonoid from Hedera helix fruits: A promising new natural sensitizer for DSSCs. *Journal of Photochemistry and Photobiology A: Chemistry*, *448*, 115288.  [4] Ozel, K., Atilgan, A., & Yildiz, A. (2024). Multi-layered blocking layers for dye sensitized solar cells. *Journal of Photochemistry and Photobiology A: Chemistry*, *448*, 115297.  [5] Atilgan, A., & Yildiz, A. (2022). Ni‐doped TiO2/TiO2 homojunction photoanodes for efficient dye‐sensitized solar cells. *International Journal of Energy Research*, *46*(10), 14558-14569.  [6] Kocak, Y., Atli, A., Atilgan, A., & Yildiz, A. (2019). Extraction method dependent performance of bio-based dye-sensitized solar cells (DSSCs). *Materials Research Express*, *6*(9), 095512.  [7] Bilen, K., & Yildiz, Y. (2023). Synergistic effect of Ga(NO3)3 & TiCl4 post-treatment on photovoltaic performance of dye-sensitized solar cells. *Applied Physics A*, *129*(4), 310. |

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