

# Accepted Manuscript

Title: Influence of illumination spectra on DSSC performance

Authors: Irén Juhász Junger, Daniel Werner, Eva Schwenzfeier-Hellkamp, Andrea Ehrmann

PII: S0030-4026(18)31439-6  
DOI: <https://doi.org/10.1016/j.ijleo.2018.09.123>  
Reference: IJLEO 61562



To appear in:

Received date: 20-7-2018  
Accepted date: 23-9-2018

Please cite this article as: Junger IJ, Werner D, Schwenzfeier-Hellkamp E, Ehrmann A, Influence of illumination spectra on DSSC performance, *Optik* (2018), <https://doi.org/10.1016/j.ijleo.2018.09.123>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Influence of illumination spectra on DSSC performance

Irén Juhász Junger, Daniel Werner, Eva Schwenzfeier-Hellkamp, Andrea Ehrmann  
*Bielefeld University of Applied Sciences, Faculty of Engineering and Mathematics, ITES, Bielefeld, Germany*

Corresponding author:

Andrea Ehrmann

Bielefeld University of Applied Sciences

Interaktion 1

33619 Bielefeld

Germany

[andrea.ehrmann@fh-bielefeld.de](mailto:andrea.ehrmann@fh-bielefeld.de)

The possibility to create dye-sensitized solar cells (DSSCs) using nontoxic and inexpensive materials under usual lab or industrial conditions, i.e. without a cleanroom, has aroused large interest in this technology during the last decades. DSSCs are known to function well in low light or diffuse light conditions. Therefore, they could be interesting for indoor use, where the ambient light may have different spectra. In DSSCs, the visible light is absorbed by a dye molecule. The efficiency is affected by the overlapping grade of the maxima in the dye absorption spectrum and in the illumination spectrum, i.e. through an appropriate choice of dye, the efficiency can be maximized for each illumination condition.

In this study the effect of the illumination spectra on the energy-conversion efficiency was investigated. DSSCs built using anthocyanin dyes were illuminated by a halogen lamp and an LED lamp with color temperatures of 3000 K and 5000 K, respectively, in combination with color filters or without them. Depending on the illumination spectra, the efficiency of the cell was found to vary between 0.06 % and 0.33 %, pointing out the importance of tailoring the DSSCs for the planned application.

Keywords: DSSC, dye-sensitized solar cell, natural dyes, illumination spectra, solar simulator

Download English Version:

<https://daneshyari.com/en/article/11016208>

Download Persian Version:

<https://daneshyari.com/article/11016208>

[Daneshyari.com](https://daneshyari.com)