

N719-Dye Based Electrochemical Light and Temperature Sensor

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In this article, electrochemical N719-Dye based integrated light and temperature sensors have been reported. The fabricated sensor exhibits interesting features such as low cost, simple fabrication process, high sensitivity and self-powering capability. Current-Voltage (I-V) and Electrochemical Impedance Spectroscopy (EIS) characterizations have been performed to study the electrical and photo-electrochemical response of the sensors. The electrochemical response has been investigated as a function of incident light intensity and temperature. The sensors show a linear current-irradiance and current-temperature relationships. The transient response and recovery times of the photo sensors are 220 msec and 630 msec, respectively. The measured sensor's responsivity is 3×10^{-4} A/W while its sensitivity is $7 \mu\text{S.m.W}^{-1}$. The above results make the newly proposed integrated light and temperature sensor very promising and pave the way for the development of simple and cost effective light and temperature sensors.

Keywords: Electrochemical cell, Dye Sensitized Solar Cell, Light sensor, Temperature sensor, electrochemical Impedance Spectroscopy.

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