

PHOTOVOLTAIC EFFECT IN COMPLEX POLYMER SYSTEMS**Ewelina Frąckowiak¹, Patrycja Ubysz², Dorota Kaczmarek², Marcin Włodarczak²
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In a traditional approach, we use polyaniline as an intrinsically semi-conducting material, which can be doped with an electron-acceptor (TCNQ) or an electron-donor (p-nitrophenol), giving the p-type or n-type semiconductors, respectively. This way, a fully organic p-n junction is formed, which is active in a photovoltaic process. We have got even more interesting and unique results using starch gel. Now, the tablet is modified on one side by adding histidine (a proton-acceptor), and cysteine hydrochloride as a proton-donor on the other side. Then, thin gold electrodes are deposited in the form of a comb. The halogen light source (35 W) of the emission spectrum close to solar light spectrum is applied. Here we present our first experiments and the first, but really exciting results (Fig. 1). One of conclusions from these studies is a possibility of construction of the analogue of a typical photovoltaic cell, based on polymeric p-n junction, including unique protonic systems [1]. The results are promising, particularly with respect to simple technology and possibility to form large-area batteries on an elastic polymer substrate (a foil).

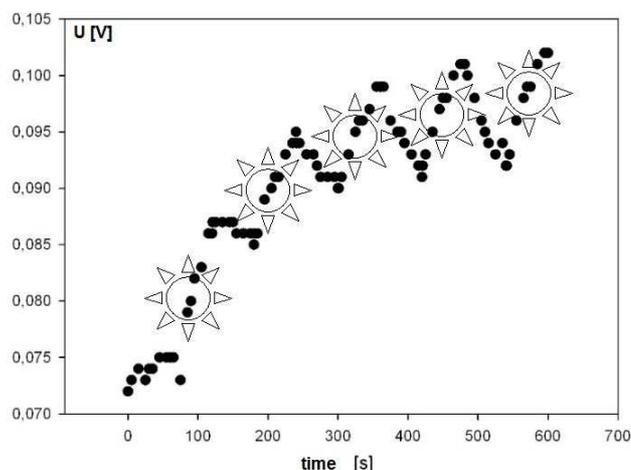


Fig. 1. Open-circuit PV effect in a unique polymeric system: starch-gel doped with histidine and cysteine hydrochloride.

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References

[1] J.J. Langer, Applied Physics A, 38(1985)59. A protonic rectifier diode; J.J. Langer, Applied Physics A, 34(1984)195, Protonic p-n junction.