

## PEO-PVP-NaIO<sub>4</sub> Polymer Complex: Checking-Up For Electric Charging

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**Abstract.** We have examined polymer blends composed from polyethylene oxide (PEO), polyvinylpyrrolidone (PVP) and sodium periodate (NaIO<sub>4</sub>). This complex material, intended to be used as a solid electrolyte [1], was produced with a weight ratio of both polymers PEO : PVP equal to 70% : 30% and by doping of 7.5 wt.% NaIO<sub>4</sub>. Thin films of PEO-PVP-NaIO<sub>4</sub> with a thickness of 100 μm were studied by electrical measurements (cyclic voltammetry and chronoamperometric) at room temperature in order to inspect them for the presence of electric charging, that is closely related to the electrolyte applicability. In contrast to pure PEO films, a very little charge trapping effect on the surface was observed for PEO-PVP-NaIO<sub>4</sub> (Figure 1), that suggests the feasibility of this polymeric complex for practical use. The lack of trapped charge carriers (ions) was correlated with the surface morphology of the examined thin films.

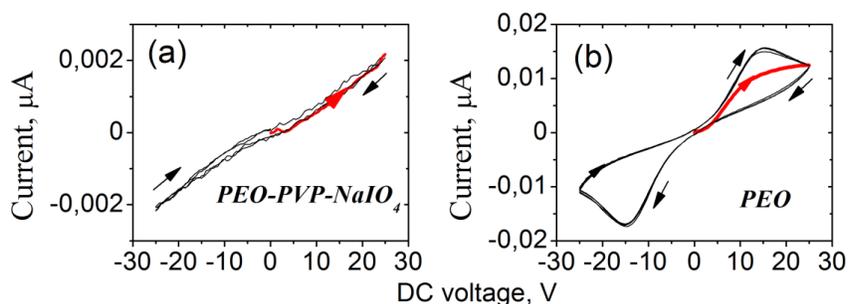


Figure 1: Voltametric curves for 100 μm-thick films of PEO-PVP-NaIO<sub>4</sub> (a) and pure PEO (b), both measured under identical other experimental conditions. The temperature of the samples was 23°C. Bold (red) lines: the initial runs.

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### **References**

- [1] K. Vignarooban, R. Kushagra, A. Elango, P. Badami, B.E. Mellander, X. Xu, T.G. Tucker, C. Nam, A.M. Kannan, Current trends and future challenges of electrolytes for sodium-ion batteries, *Int. J. Hydrogen Energy* **41** (2016) 2829–2846.