

5<sup>TH</sup> REGIONAL  
SYMPOSIUM ON  
ELECTROCHEMISTRY  
SOUTH EAST EUROPE

PROGRAM  
BOOK OF ABSTRACTS

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## Microwave Synthesis of Unusually-Shaped Crystalline RuO<sub>2</sub> Supercapacitor

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One-step simple temperature-controlled microwave synthesis was applied to prepare nanocrystalline RuO<sub>2</sub> dispersion from aqueous RuCl<sub>3</sub>. RuO<sub>2</sub> dispersion was subjected to dynamic light scattering in order to analyze the synthesized particles, whereas structural and morphological properties of the solid phase are investigated by AFM, SEM, EDAX and XRD techniques. The ordered unusual shape of ca. 100-nm native particles, as well as highly-ordered prismatic agglomerate sheets are observed. Capacitive properties of RuO<sub>2</sub> was investigated by cyclic voltammetry and electrochemical impedance spectroscopy in 1 M H<sub>2</sub>SO<sub>4</sub> and standard three-electrode cell, with ink-type working electrode on glassy carbon substrate. A specific capacitances as high as 750 F/g were obtained, which negligibly depend on sweep rate in 5–500 mV/s range (Fig. 1). These findings are quite unusual for this kind of material consisted of rather large particles [1], and makes it excellent candidate for both low and high power applications. The capacitive response appears stable during prolonged charge/discharge cycling.

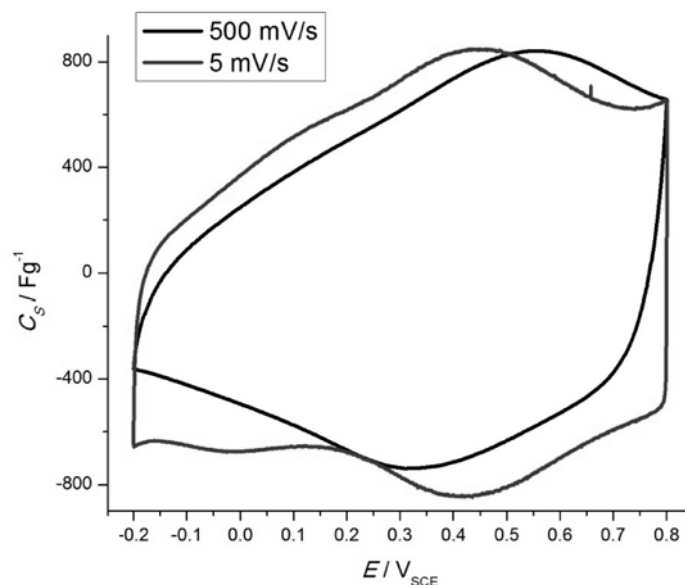


Fig.1. Cyclic voltammograms of nanocrystalline RuO<sub>2</sub> in 1 M H<sub>2</sub>SO<sub>4</sub>.

### References

- [1] J. P. Zheng, P. J. Cygan, T.R. Jow, J. Electrochem. Soc. 142 (1995) 2699