

**FIFTEENTH ANNUAL CONFERENCE**

# **YUCOMAT 2013**

Hunguest Hotel Sun Resort Herceg Novi, Montenegro,  
September 2-6, 2013  
<http://www.mrs-serbia.org.rs>

## **Programme and The Book of Abstracts**

Organised by:  
**Materials Research Society of Serbia**

under the auspices of  
**Federation of European Material Societies  
and  
Materials Research Society**

**Title:** THE FIFTEENTH ANNUAL CONFERENCE  
**YUCOMAT 2013**  
Programme and The Book of Abstracts

**Publisher:** Materials Research Society of Serbia  
Knez Mihailova 35/IV, 11000 Belgrade, Serbia  
Phone: +381 11 2185-437; Fax: + 381 11 2185-263  
<http://www.mrs-serbia.org.rs>

**Editors:** Prof. Dr. Dragan P. Uskoković and Prof. Dr. Velimir Radmilović

**Technical editor:** Aleksandra Stojičić

**Cover page:** Aleksandra Stojičić and Milica Ševkušić

**Copyright** © 2013 Materials Research Society of Serbia

**Acknowledgments:**



**Printed in:** Biro Konto  
Sutorina bb, Igalo – Herceg Novi, Montenegro  
Phones: +382-31-670123, 670025, E-mail: [bkonto@t-com.me](mailto:bkonto@t-com.me)  
Circulation: 220 copies. The end of printing: August 2013

P.S.A.18.

### **CARBON COATED LiFePO<sub>4</sub> CATHODE MATERIAL OBTAINED BY FREEZE-DRYING METHOD**

M. Kuzmanović<sup>1</sup>, D. Jugović<sup>1</sup>, M. Mitrić<sup>2</sup>, B. Jokić<sup>3</sup>, N. Cvjetičanin<sup>4</sup>, D. Uskoković<sup>1</sup>

<sup>1</sup>*Institute of Technical Sciences of SASA, Belgrade, Serbia,*

<sup>2</sup>*The Vinča Institute of Nuclear Science, University of Belgrade, Belgrade, Serbia,*

<sup>3</sup>*Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia,*

<sup>4</sup>*Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia*

One of the most perspective cathode materials for the application in the Li-ion batteries is LiFePO<sub>4</sub>. It has high theoretical specific capacity, good cycle life and technically suitable flat voltage of 3.45 V versus Li. However, its main disadvantages are low electronic and ionic conductivities which can be overcome by particle size minimization and/or carbon coating. Here is presented the freeze-drying method for the preparation of carbon coated LiFePO<sub>4</sub> particles. It involves freezing of a precursor solution, vacuum drying and final calcination of as-dried powder under slightly reductive atmosphere. The main advantage of this preparation process is mixing at the atomic level which provides more homogeneous precursor. Water solutions containing Li<sup>+</sup>, PO<sub>4</sub><sup>3-</sup> and Fe<sup>2+</sup> ions with the addition of various organic compounds as a carbon source were used as the precursor solutions. The as-prepared powders were fully characterized by means of X-ray powder diffraction, scanning electron microscopy, particle size analyzer and galvanostatic cycling.

P.S.A.19.

### **LiFePO<sub>4</sub> NANOCRYSTALS SYNTHESIS BY HYDROTHERMAL REDUCTION METHOD**

Z. Stojanović<sup>1</sup>, M. Kuzmanović<sup>1</sup>, M. Tadić<sup>2</sup>, R. Dominko<sup>3</sup>, D. Uskoković<sup>1</sup>

<sup>1</sup>*Centre for Fine Particles Processing and Nanotechnologies, Institute of Technical Sciences of SASA, Belgrade, Serbia,* <sup>2</sup>*Condensed Matter Physics Laboratory, Vinča Institute, University of Belgrade, Belgrade, Serbia,* <sup>3</sup>*National Institute of Chemistry, Ljubljana, Slovenia*

The nanocrystals of LiFePO<sub>4</sub> a cathode material for Li-ion batteries were synthesized by simple one – pot combined colloidal hydrothermal reduction approach. The influences of surfactant ratios on nanocrystal formation are investigated. Also extent of surface modification and agglomeration is assessed. The electrochemical performance of material is investigated on as prepared samples and on samples with carbonized surface layer. The XRD, TEM, SEM, FTIR, laser diffraction PSA, magnetic measurements and galvanostatic cycling are performed characterization techniques.