ELEVENTH ANNUAL CONFERENCE

YUCOMAT 2009

Hotel “Plaža”, Herceg Novi, Montenegro, August 31 - September 4, 2009
http://www.mrs-serbia.org.rs

Programme
and
The Book of Abstracts

Organised by:
Materials Research Society of Serbia,
and
Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Belgrade

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

Title: THE ELEVENTH ANNUAL CONFERENCE
"YUCOMAT 2009"
Programme and The Book of Abstracts

Publisher: Institute of Technical Sciences of the Serbian Academy of Sciences & Arts
Knez Mihailova 35/IV; P.O. Box 377, 11000 Belgrade, Serbia
Phone: +381 11 2185-437; Fax: + 381 11 2185-263
http://www.itn.sanu.ac.rs

Editor: Prof. Dr. Dragan P. Uskoković

Technical editor: Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Acknowledgment:

Printed in: Printing office "Čigoja"
Studentski trg 15, 11000 Belgrade
Phones: + 381 11 2186-725; + 381 11 625-954
Circulation: 300 copies. The end of printing: July 2009.

ISBN 978-86-80321-18-9

9 788680 321189

CIP – Каталогизација у публикацији
Народна библиотека Србије, Београд

66.017/.018(048)

MATERIALS Research Society (Beograd). Conference (11 ; 2009 ; Herceg Novi)
Programme ; and The Book of Abstracts / Eleventh Annual Conference YUCOMAT 2009, organized by Materials Research Society of Serbia and Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Belgrade ; [editor Dragan P. Uskoković]. – Belgrade : Institute of Technical Sciences of SASA, 2009 (Belgrade : Čigoja).– L, 219 str. ; 24 cm

Tiraž 300. – Registar.

ISBN 978–86–80321–18–9
1. Materials Research Society (Beograd) 2. Institute of Technical Sciences of SASA (Beograd)

a) Наука о материјалима – Апстракти b) Технички материјали – Апстракти
COBISS.SR–ID 168339724

P.S.A.23.

HYDROTHERMAL SYNTHESIS OF $LiFePO_4$ POWDERS AS CATHODE MATERIAL FOR Li-ION BATTERIES

M. Jović, Z. Stojanović. Lj. Veselinović, D. Uskoković
Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Belgrade, Serbia

Phospho-olivine $LiFePO_4$ have been intensively studied as lithium insertion cathode materials for next generation of Li-ion secondary batteries. $LiFePO_4$ has an interesting theoretical specific capacity of about 170 $mAhg^{-1}$, a good cycle stability and technically attractive flat voltage versus current profile of 3.45 V versus Li^+/Li. A further advantage of this material, thanks to its stability, is the improved safety at high temperatures. In this work, $LiFePO_4$ was prepared by hydrothermal reaction starting from water solutions of LiOH, $FeSO_4$ and H_3PO_4. After hydrothermal reaction the obtained powder was heat treated in reduction atmosphere to avoid oxidation of Fe^{2+} to Fe^{3+}. Powder was additionally treated by high energy ball-milling. The structural and morphological properties of $LiFePO_4$ powder was characterized by X- ray diffraction and scanning electron microscopy. $LiFePO_4/Li$ battery was characterized electrochemically by constant current charge-discharge cycling.

P.S.A.24.

IMPACT OF SOLVENT MIXTURE COMPOSITION AND ADDITIVE PRESENCE ON $LiFePO_4$ FORMATION IN WATER – ISO-PROPANOL SOLUTIONS AT ELEVATED TEMPERATURES AND PRESSURES

Z. Stojanović, M. Jović, D. Uskoković
Institute of Technical Sciences of SASA, Belgrade, Serbia

High capacity storage of electric energy is technology of strategic importance for modern society. As lithium-ion batteries with their high capacity and generated power can improve electrical storage for electric vehicles and portable devices; they became a one of the major topics of research today. One of most perspective cathode material for lithium-ion batteries is $LiFePO_4$. Superior characteristics of this material are high Li storage capacity, stability, non-toxicity and low price, major disadvantage is low electronic conductivity. In this work we have investigated possibility to obtain pure $LiFePO_4$ nano-crystalline powders using water – iso-propanol mixture as reaction medium at temperatures in range of 180 to 220 ^oC and corresponding equilibrium pressures in stainless steel autoclave. Time was varied from 1 up to 24 h. In supplement, impact of different organic additives on morphology and size of particles is examined. Phase composition is determined by XRPD, morphology of particles by SEM and particle size distribution from light scattering measurements (LPSA). Electrochemical characterization of synthesized material is performed by constant current charge/discharge cycling.