

Twelfth Young Researchers' Conference
Materials Science and Engineering

December 11-13, 2013, Belgrade, Serbia
Serbian Academy of Sciences and Arts, Knez Mihailova 36

Program and the Book of Abstracts

Materials Research Society of Serbia
Institute of Technical Sciences of SASA

December 2013, Belgrade, Serbia

Book title:

Twelfth Young Researchers' Conference - Materials Science and Engineering:
Program and the Book of Abstracts

Publisher:

Institute of Technical Sciences of SASA
Knez Mihailova 35/IV, 11000 Belgrade, Serbia
Tel: +381-11-2636994, fax: 2185263
<http://www.itn.sanu.ac.rs>

Editor:

Dr. Smilja Marković

Technical Editor:

Aleksandra Stojičić

Printer:

Gama digital centar
Autoput No. 6, 11070 Belgrade, Serbia
Tel: +381-11-6306992, 6306962
<http://www.gdc.rs>

Edition:

130 copies

Acknowledgement

The editor and the publisher of the Book of abstracts are grateful to the Ministry of Education, Sciences and Technological Development of the Republic of Serbia for its financial support of this book and The Twelfth Young Researchers' Conference - Materials Sciences and Engineering held in Belgrade, Serbia.

CIP - Каталогизacija у публикацији
Народна библиотека Србије, Београд

66.017/.018(048)(0.034.2)

YOUNG Researchers Conference Materials Sciences and Engineering (12 ; 2013 ; Beograd)

Program ; #and the #Book of Abstracts / Twelfth Young Researchers' Conference Materials Sciences and Engineering December 11-13, 2013, Belgrade, Serbia ; [organized by] Materials Research Society of Serbia [and] Institute of Technical Sciences of SASA; [editor Smilja Marković]. - Belgrade : Institute of Technical Sciences of SASA, 2013 (Beograd : Gama digital centar). - XVI, 56 str. ; 30 cm

Tiraž 130. - Registar.

ISBN 978-86-80321-28-8

1. Materials Research Society of Serbia (Beograd)

a) Наука о материјалима - Апстрактни b) Технички материјали - Апстрактни

COBISS.SR-ID 203232780

IX/1

Electrochemical intercalation of lithium in $\text{Li}_4\text{T}_{15}\text{O}_{12}/\text{C}$ composite with different percentage of carbon

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$\text{Li}_4\text{T}_{15}\text{O}_{12}/\text{C}$ composites with different content of carbon black (16 wt.% LITX200L, 32 wt.% LITX200L, 60 wt.% LITX200L, 61 wt.% PBX51) were prepared in two steps under identical conditions: hydrothermal reaction at 130 °C and post-calcination at 400 °C. The accent is on electrochemical measurements and how carbon content influences on electrochemical properties of $\text{Li}_4\text{T}_{15}\text{O}_{12}/\text{C}$ composites. The $\text{Li}_4\text{T}_{15}\text{O}_{12}/60\%$ LITX200L composite showed best electrochemical performance: the cyclic voltammograms consisted of well defined reversible redox peaks at a scan rate as high as 10 mV/s, while, galvanostatic cycling showed coulombic capacity of 162 mAh/g at a discharging rate of 1C.

IX/2

Sol-gel synthesis of $\text{Li}_2\text{FeSiO}_4/\text{C}$

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Lithium transition-metal orthosilicates with general formula Li_2MSiO_4 (M = Fe, Mn, Co, etc.) have attracted a lot of interest due to their potentially high theoretical capacities arising from the possibility of the extraction of two Li-ions per formula unit. $\text{Li}_2\text{FeSiO}_4$ takes prominent position among this family of compounds due to its structural stability and natural abundance of iron. In this study, $\text{Li}_2\text{FeSiO}_4/\text{C}$ composite was synthesized by simple method which involves rapid heating, short high-temperature delay, and subsequent quenching. Starting materials were Li_2CO_3 , $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$, $\text{Si}(\text{OC}_2\text{H}_5)_4$ (TEOS) and water-soluble methylcellulose. Precursor preparation is based on the sol-gel processing and provides homogenous mixing at the molecular level. Structural analysis, morphology examination and electrochemical test of thus obtained powder were performed.