VII INTERNATIONAL CONFERENCE ON MECHANOCHEMISTRY AND MECHANICAL ALLOYING

INCOME 2011

Herceg Novi, Montenegro, August 31 – September 3, 2011
http://www.mrs-serbia.org.rs/income2011/income2011.html

Programme and The Book of Abstracts

Organised by
Materials Research Society of Serbia

under the auspices of
International Mechanochemistry Association

Title: VII INTERNATIONAL CONFERENCE ON MECHANOCHEMISTRY AND MECHANICAL ALLOYING INCOME 2011
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

Editor: Prof. Dr. Dragan P. Uskoković

Technical editor: Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Acknowledgment:

NT-MDT
INTEGRATED SOLUTIONS FOR NANOTECHNOLOGY

Printed in: Biro Konto
Sutorina bb, Igalo – Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me
Circulation: 200 copies. The end of printing: August 2011

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THE MECHANOCHEMICAL TREATMENT OF $V_2O_5/(NH_4)_2Mo_2O_7$ MIXTURE

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The mechanochemical treatment of $V_2O_5/(NH_4)_2Mo_2O_7$ (ADM) mixture was studied for the first time. It was found that dry treatment brings about partial decomposition of ADM with formation of Mo_9O_{26} without changes in V_2O_5 phase. The milling in ethanol leads to formation of Mo_9O_{26} and $MoO_{2.8}$ phases as well as to anisotropic deformation of V_2O_5 with increase of basal plane content. The milling in water causes two types of changes. At the short-time treatment the formation of Mo_9O_{26}, $MoO_{2.8}$, χ-Mo_8O_{23} and $V_2O_5{\cdot}nH_2O$ took place. The elongation of milling time leads to reaction between $V_2O_5{\cdot}nH_2O$ and NH_3 with formation of $(NH_4)_2V_6O_{16}{\cdot}2H_2O$ and hydration of molybdenum suboxides to $HMoO_3{\cdot}2H_2O$. It was found that the samples containing molybdenum suboxide mixture and $V_2O_5{\cdot}nH_2O$ show high selectivity to propylene in oxidative dehydrogenation of propane.

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SPECTRAL AND MECHANICAL PROPERTIES OF THE MATERIALS STRUCTURED WITH CARBON NANOTUBES

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Carbon nanotubes are considered as the good candidate to modify the surface properties of the organic and inorganic structures. Both the spectral and mechanical properties as well as quantum chemical simulation are discussed to explain the increase in transmission and hardness of the nanostructured polyvinyl alcohol films, magnesium fluoride, etc. The basic features of carbon nanotubes are regarded to their small refractive index, strong hardness of C—C bonds as well as complicated and unique mechanisms of charge carrier moving. The structures of the composite films and their mechanical properties are modeled too. The peculiarities of new nanostructured materials and their possible optoelectronics and display applications will be under consideration. The results have been supported by RFBR grant #10-03-00916 and RAS Presidium Program # 21.