

Programme & The Book of Abstracts

Seventeenth Annual Conference

YUCOMAT 2015

Herceg Novi, Montenegro, August 31 – September 4, 2015

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MATERIALS RESEARCH SOCIETY OF SERBIA

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20th Anniversary YUCOMAT Conference

SEVENTEENTH ANNUAL CONFERENCE

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Hunguest Hotel Sun Resort Herceg Novi, Montenegro,
August 31-September 4, 2015
<http://www.mrs-serbia.org.rs>

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**Materials Research Society,
European Materials Research Society
and
Federation of European Material Societies**

Title: THE SEVENTEENTH ANNUAL CONFERENCE
YUCOMAT 2015
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Publisher: Materials Research Society of Serbia
Knez Mihailova 35/IV, P.O.Box 433, 11000 Belgrade, Serbia
Phone: +381 11 2185-437; Fax: + 381 11 2185-263
<http://www.mrs-serbia.org.rs>

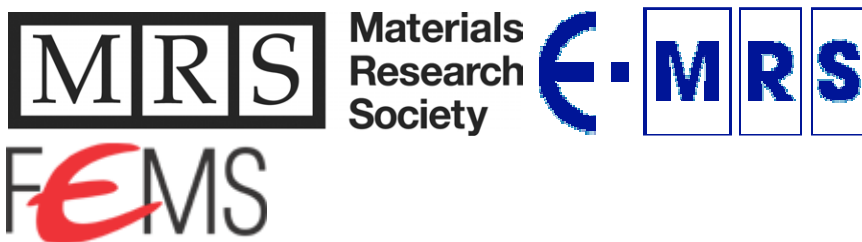
Editors: Prof. Dr. Dragan P. Uskoković and Prof. Dr. Velimir Radmilović

Technical editor: Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić
Front cover: modified photo by BélaBéla; Wikimedia
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Acknowledgments: This conference is 20th Anniversary of the First YUCOMAT Conference.



Printed in: Biro Konto
Sutorina bb, Igalo – Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me
Circulation: 220 copies. The end of printing: August 2015

A Facile Determination Method for an Androstane-based Lung Cancer Inhibitor Loaded in Nano/Micro Particles Based on Hydroxyapatite by Means of DTA/TGA Coupled with On-line Mass Spectrometry

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In our study, we examined the possibilities for the application of Thermo-Gravimetric Analysis/Differential-Thermal Analysis (DTA/TGA) coupled on-line with mass spectrometry (MS) as a fingerprint for identification purposes in drug loading processes. Androstane derivative 17 β -hydroxy-17 α -picolyl-androst-5-en-3 β -yl acetate (2-OAc) with antitumor activity was loaded in nano hydroxyapatite (HAp) coated with chitosan-poly(D,L)-lactide-co-glycolide (Ch-PLGA) by emulsification and finally freeze-dried. By means of DTA/TGA-MS, it was quickly determined that the form of 2-OAc was the same before and after loading. The observed exothermic and endothermic processes due to the transformation of material with simultaneous analysis of gas products have proven to be successful in the analysis of drug loading processes in multi-component ceramic-polymer carriers. The loading efficiency of 74.7% was determined using the Differential Scanning Calorimetry (DSC) technique. A FT-IR analysis confirmed the qualitative composition of the synthesized 2-OAc-loaded HAp/Ch-PLGA.

The *in vitro* antiproliferative activity was evaluated against human cell lines: lung adenocarcinoma (A549), as well as healthy fetal lung fibroblasts (MRC-5). The results of DET and MTT tests have revealed a high viability of healthy cells MRC-5 (82%) and the death of cancer cells A549 (46%) after a treatment with 2-OAc-loaded HAp/Ch-PLGA.