Faculty of Technology
University of Novi Sad

Conference for Young Scientists in Ceramics

10th Students' Meeting
and
3rd ESR COST MP0904 Workshop

Book of Abstracts

SM 2013
COST SIMUFER

Novi Sad, Serbia, November 6-9, 2013

CONFERENCE for YOUNG SCIENTISTS in CERAMICS

The Tenth Students' Meeting, SM-2013
The Third ESR Workshop, COST MP0904

PROGRAMME
and
BOOK OF ABSTRACTS

November 6-9, 2013
Novi Sad, Serbia

Programme and Book of Abstracts of The Conference for Young Scientists in Ceramics (The Tenth Students' Meeting - SM-2013, and The Third ESR Workshop, COST MP0904) publishes abstracts from the field of ceramics, which are presented at traditional international Conference for Young Scientists in Ceramics.

Editors-in-Chief
Prof. Dr. Vladimir V. Srdić
Prof. Dr. Liliana Mitoseriu

Publisher
Faculty of Technology, University of Novi Sad
Bul. cara Lazara 1, 21000 Novi Sad, Serbia

For Publisher
Prof. Dr. Zoltan Zavargo

Printing layout
Vladimir V. Srdić, Branimir Bajac

Press
FUTURA, Petrovaradin, Serbia

CIP – Каталогизација у публикацији
Библиотека Матице српске, Нови Сад

666.3/.7(048.3)

STUDENTS' Meeting, Processing and Application of Ceramics (10 ; 2013 ; Novi Sad)

Programme and book of abstracts / The Tenth Students' Meeting [Processing and Application of Ceramics], SM-2013 [and] the Third ESR [Early Stage Researchers] Workshop, COST MP0904 [being a] Conference for Young Scientists in Ceramics, November 6-9, 2013, Novi Sad ; [editors-in-chief Vladimir V. Srdić, Liliana Mitoseriu]. - Novi Sad : Faculty of Technology, 2013 (Petrovaradin : Futura). - XVI, 145 str. : ilustr. ; 24 cm.

Tiraž 170. - Srt. III: Preface / editors. - Registar.

ISBN 978-86-6253-028-8
1. Early Stage Researchers Workshop, COST MP0904 (3 ; 2013 ; Novi Sad) 2. Conference for Young Scientists (2013 ; Novi Sad). - I . SM-2013 v. Students' Meeting Processing and Application of Ceramics (10 ; 2013 ; Novi Sad). - II. ESR Workshop, COST MP0904 v. Early Stage Researchesrs Workshop, COST MP0904 (3 ; 2013 ; Novi Sad). - III. COST SIMUFER v. Early Stage Resrearchers Workshop, COST MP0904 (3 ; 2013 ; Novi Sad)

a) Керамика – Технологија – Апстракти
COBISS.SR-ID 281371911

CONTENT

PROGRAMME

The Tenth Students' Meeting, SM-2013
PROCESSING AND APPLICATION OF CERAMICS

PLENARY LETURE, SM-2013

INVITED LETURES, SM-2013

TRADITIONAL CERAMICS, SM-2013

"The Tenth Students' Meeting", SM-2013
PROCESSING AND APPLICATION OF CERAMICS
Novi Sad, Serbia, November 6-9, 2013

T2

INFLUENCE OF DOPING AGENT ON THE MULLITISATION PROCESS IN ALUMOSILICATE CERAMICS

L. Mahnicka-Goremikina, R. Svinka, V. Svinka

Riga Technical University, Institute of Silicate Materials, Azenes Str. 14/24, LV-1048 Riga, Latvia

Keywords: mullite, kaolin, alumina, metal oxide, porosity, refractory ceramics

The ceramics for heat insulation, improvement of technological process of ceramics production, economy of energy and raw materials are actual nowadays. For example, the refractoriness of alumosilicate ceramics at temperature above 1580 °C can be achieved when mullite ($3Al_2O_3 \cdot 2SiO_2$) phase is the main crystalline phase of these materials. Mullite ceramics also display definite mechanical strength and excellent resistance to chemical corrosion. Therefore the dense mullite ceramics have been widely used as constructional materials as well as the high porosity mullite ceramics serve as heat insulators and filters in the thermal protection systems and technical equipments.

Different alumina and silica raw materials can be used for such ceramic production. The process of mullitisation, its initial temperature and dominance of mullite phase depends on these raw materials and some additives such as metal oxides. Therefore the aim of this work was to investigate the influence of MgO, WO_3 and ZrO_2 on the process of mullitisation of samples. The porous mullite materials were prepared by slip casting of suspension of raw materials where the aluminium paste was used as a pore former. The raw materials were kaolin (*MEKA, Germany* with SiO_2 - 56.2 wt.%, Al_2O_3 - 31.0 wt.%), pure silica (d_{50} = 6.94 μm), different alumina (*Nabalox, Germany*, α-Al_2O_3 (d_{50} = 4 μm) and γ-Al_2O_3 (d_{50} = 80 μm). The Al_2O_3 and SiO_2 were in 2.57:1 ratio and conformed to the mullite stechiometric composition ($3Al_2O_3 \cdot 2SiO_2$). The ratio of α- and γ-alumina was 1:3. The kaolin used 30 wt.%, additives - 1, 3, 5 and 7 wt.%. Porous mullite ceramic was obtained by slip casting of suspension of raw materials and H_2 elimination by chemical reaction of Al with water. The samples were sintered at the different temperatures (1300 °C, 1500 °C, 1650 °C and 1700 °C).

The Differential thermal analysis, X-ray diffraction analysis and scanning electron microscopy were used as the main methods respectively for analysis of mullitisation beginning, phase composition and microstructure of samples.