11TH CONFERENCE
FOR YOUNG SCIENTISTS IN CERAMICS

Satellite event:
ESR COST IC1208 Workshop

BOOK OF ABSTRACTS

October 21-24, 2105
Faculty of Technology
Novi Sad, Serbia

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ESR Workshop, COST IC1208

PROGRAMME
and
BOOK OF ABSTRACTS

October 21-24, 2015

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A49

SYNTHESIS OF MONETITE ($CaHPO_4$) BY MECHANOCHEMICAL TREATMENT OF BRUSHITE ($CaHPO_4 \cdot 2H_2O$)

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Synthesis of monetite ($CaHPO_4$) by means of mechanochemical treatment of brushite ($CaHPO_4 \cdot 2H_2O$) was studied. Start sample (Brushite) was obtained by precipitation method at room temperature. Particle size of brushite was reduced using vibromilling. The powders were analyzed by X-ray powder diffraction (XRPD). Microstructure and morphology was determined by means of scanning electron microscopy (SEM). Brunauer-Emmett-Teller (BET) method was used for examining specific surface area of obtained powders. It was found that five minutes of milling induces brushite-monetite phase transformation. This type of synthesis is cost-effective compared to the other used methods for synthesis of monetite.

A50

DEVELOPMENT OF INNOVATIVE 3D POROUS TiO_2 CERAMIC SCAFFOLDS FOR ORTHOPAEDIC APPLICATIONS

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The development of scaffolds for replacement of injured and diseased hard tissues such as bones is highly desired in orthopaedic surgery. The porous structure of scaffold provide necessary framework for the bone cells to grow into the pores and integrate with host tissue, known as osteointegration. Thus porosity and pore size of biomaterial scaffolds play a critical role and also has great impact on mechanical properties. Particular attention has attracted TiO_2 ceramic scaffolds due to its excellent mechanical properties compared to other ceramic materials, biocompatibility and good osteoconductivity.

TiO_2 scaffolds were produced via polymer foam replica method. Commercially available anatase powder, polyvinyl alcohol solution, ethylene glycol, ammonia solution and deionised water were used as raw materials for ceramic slurry preparation. Homogenisation of the slurry was conducted by stirring for different period of time. Particle size distribution, viscosity and pH of titania slurry were monitored during stirring. Cylindrical polyurethane foams with fully interconnected pore structure serves as a sacrificial template for the ceramic coating. After drying, the polymer was slowly burned out and scaffolds were sintered in air at different temperatures (>1300°C) and holding times.