

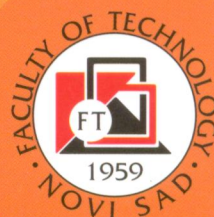
**PROCESSING AND APPLICATION  
OF CERAMICS**

# **VII Students' Meeting**

**SM-2007**



**Faculty of Technology  
University of Novi Sad**



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### COMPARISON OF THE YTTRIUM ALUMINIUM GARNET (YAG) NANOPOWDER PREPARATION METHODS

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This paper presents results of investigation of YAG powders synthesis process based on complexing properties of citric acid. Influence of citric acid estrification induced by propanol, or ethylene glycol on the system homogeneity was investigated. These reagents were introduced to water solution of yttrium and aluminum nitrates. A variety of powders from  $Al_2O_3$ - $Y_2O_3$  system with different phase composition were obtained by altering the citrate to nitrate ratio. Evolution of the powders phase composition vs. temperature was investigated using DTA/TG, XRD, and FT-IR methods. The most interesting results were observed in case of citric acid – propanol – relative nitrates system. Mole ratio of these reagents equal 1:2.5:2.5 (nitrates (Al, Y) : citric acid : propanol) allowed to synthesize pure YAG phase powders at temperature as low as 950°C.

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### EFFECT OF SYNTHESIS METHOD ON $BaTiO_3$ PROPERTIES

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Barium titanate ( $BaTiO_3$ ) has been of practical interest for more than 60 years because of its attractive properties.  $BaTiO_3$  can be prepared using different methods. It was detected a significant influence of used method on structure and properties of barium titanate materials.

In this paper powder of  $BaTiO_3$  was prepared by two methods. The first one was synthesis from polymeric precursors through Pechini process (soft chemistry-PPM) which was carried out as a three-stage process from organometallic complex [1]. The second one was a mechanochemical synthesis from powder mixture of  $BaO$  and  $TiO_2$  [2]. In both cases  $BaTiO_3$  was sintered for 2h at 1300°C without pre-calcination step. The formations of phase and crystal structure of  $BaTiO_3$  prepared by both methods were carried out by XRD analysis. The morphology and microstructure of obtained powders and sintered samples were examined by SEM method.