Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION IX
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 20-21. September 2021.

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Sol-gel synthesis of titanium dioxide in acidic conditions

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To obtain the titania (TiO_2) nanoparticles, the conventional sol-gel method under acidic conditions, pH around 2, was employed. After synthesis, the obtained powder was calcinated at 500 and 700 °C. The X-ray diffraction analysis confirmed that the heat-treated powder at 500 °C was anatase phase, while the heat-treated powder at 700 °C was the mixture of anatase and rutile phase. The crystallite size of the anatase phase at 500 °C was 15 nm whereas at 700 °C crystallite size of the anatase was 47 nm and 63 nm for the rutile phase. The characteristic FE–SEM images revealed well distributed spherical shaped nanoparticles. An average diameter of nanoparticles was in the range of 20 – 30 nm. The average size of nanoparticles in the sample treated at 500 °C was lower than the nanoparticles in the one treated at 700 °C. Therefore, the specific surface area of synthesized pure TiO_2 after heat treatment at lower temperatures is higher, promising better absorption and photocatalytic activity.