

## INVESTIGATION OF THE STRONTIUM TITANATE (SrTiO<sub>3</sub>) AND SOIL EXTRACT INTERACTION

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### Abstract

The study was aimed on the investigation of strontium titanate photocatalysts (SrTiO<sub>3</sub>) and soil extract interaction. Both commercial and synthesized SrTiO<sub>3</sub> photocatalysts were studied in the present work. The latter was obtained via a solvothermal crystallization method (applying different synthesis parameters: treatment time, NaOH source and precursor ratio). The result of the soil solution (extracted from solonetz/basic soils) - catalyst interaction was studied via the photocatalytic activity towards phenol degradation under UV-light. The SrTiO<sub>3</sub> nanoparticles were characterized by X-ray diffractometry (XRD), infrared spectroscopy (IR), diffuse reflectance spectroscopy (DRS) and scanning electron microscopy (SEM). The phenol degradation experiments revealed that synthesized SrTiO<sub>3</sub> showed higher photocatalytic activity than commercial SrTiO<sub>3</sub>. The XRD patterns revealed that crystalline structure of each sample was preserved, while the primary crystallite size values obtained decreased following immersion in the basic soil extracts. The IR results showed that the surface properties of both commercial and synthesized SrTiO<sub>3</sub> photocatalysts were modified. Based on DRS investigations, all samples immersed in basic soil solutions changed their color. However, no changes were observed in the band gap for commercial SrTiO<sub>3</sub> while for the synthesized SrTiO<sub>3</sub> smaller changes were observed. The SEM micrographs showed only signs of particle aggregation.

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