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## NEW TiO<sub>2</sub>-Ag NANOPARTICLES USED FOR ORGANIC COMPOUNDS DEGRADATION

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### Abstract

TiO<sub>2</sub>-assisted photocatalysis is used in numerous environmental applications and for the manufacturing of different products. Ag-doped TiO<sub>2</sub> nanoparticles were synthesized by impregnation using silver nitrate solution on TiO<sub>2</sub> obtained by sol-gel method and on commercial Degusa P25 (Evonik). Silver is widely studied as a dopant for semiconductor materials, due to its antibacterial properties. In addition to this, it acts as electron sink and donor for photogenerated electrons, enhancing the photocatalytic activity. The physical properties of the samples calcined at different temperatures were investigated by XRD, XRF, SEM, TEM, SAED and EDAX techniques. The calcination temperature of 650°C led to the total transformation of titanium dioxide (anatase) to rutile phase when commercial P25 was doped with Ag. In the case of samples produced by sol-gel method, the anatase is still the major phase even at this temperature. The photocatalytic activity of the synthesized catalysts was evaluated in the UV-assisted photodegradation of Rhodamine 6G and Congo Red dyes. The conversion yield of Rhodamine 6G reached 66.5% and that of Congo Red was 53% after 120 minutes of irradiation.

*Key words:* photocatalysis, photodegradation, silver, titanium oxide

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