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### **Preparation and properties of photocatalyst in TiO<sub>2</sub>-ZnO system**

Anita Letlena, Jānis Grabis, Aija Krūmiņa  
Riga Technical University, Faculty of Material Science and Applied Chemistry,  
Institute of Inorganic Chemistry, Latvia

Titania and zinc oxide nanoparticles have known as the most promising photocatalysts under ultraviolet radiation. The combining of TiO<sub>2</sub> and ZnO will improve the properties of photocatalyst due to interfacial interaction, efficient charge separation of photo-activated electrons and holes, as well as to formation of zinc titanates.

The aim of the present work was preparation of nanoparticles in TiO<sub>2</sub>-ZnO system with various ratio of components and determination their photocatalysts activity in dependence on powders parameters.

Particulate TiO<sub>2</sub>-ZnO composites were prepared by sol-gel method using Ti(OC<sub>4</sub>H<sub>9</sub>)<sub>4</sub>, Zn(CH<sub>3</sub>COO)<sub>2</sub>, Ti[OCH(CH<sub>3</sub>)<sub>2</sub>]<sub>4</sub>, triethanolamine or acetic acid. Specific surface area of the prepared samples was in the range of 12.6-56.8 m<sup>2</sup>/g and crystallite size in the range of 10-100 nm depending on the ratio of components and calcination temperature. Increase of Zn/Ti molar ratio from 0.1 to 3.3 leads to decrease of ZnO phase and the formation of titanate phases. The highest photocatalytic activity in degradation of MB solution shows sample prepared at Zn/Ti ratio in the range of 1.0-3.3 and calcinated at 600-700 °C due to high content of ZnTiO<sub>3</sub> phase.

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