

UNIVERSITY OF BELGRADE  
TECHNICAL FACULTY IN BOR



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## VISIBLE-LIGHT PHOTOCATALYTIC DEGRADATION OF MODEL POLLUTANT (MO-METHYL ORANGE) IN SOLID-STATE

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### Abstract

In the last few years, the demands placed in the field of environmental protection have been increasing, resulting in a reduction of pollutant emissions. Exhaust gases and atmospheric pollutants significantly affect the pollution and pollution of construction facilities, which significantly reduces their durability. The goal of the work is the synthesis and development of photocatalytically materials active in visible light for self-cleaning of external and internal walls. A series of TiO<sub>2</sub>\_ZnAl layered double hydroxides (LDHs) based composites were synthesized and their photocatalytic efficiency of the Methyl orange photodegradation reaction under visible light irradiation was tested [1]. Synthesis of concentrated suspension based on anionic clays (titanium dioxide doping method) under controlled pH conditions - TiO<sub>2</sub>\_ZnAl\_LDH doped with (1, 2, 5 and 10 wt.% ((NH<sub>4</sub>)<sub>2</sub>WO<sub>4</sub>). The optimal pH value was found to be 8 [2]. The concentrated suspension was diluted and stabilized with the addition of suitable dispersants. Methyl orange (MO) of optimized concentration was used as a pollutant.

The photocatalytic suspension was characterized by SEM- Scanning electron microscopy, XRD- X-ray diffraction, UV-VIS- Ultraviolet visible spectroscopy and FTIR- Fourier-transform infrared spectroscopy. Samples for photocatalytic tests were prepared by applying the suspension and model pollutant to the stone surface. Samples were placed under a visible light source and the degradation of the model pollutant and self-cleaning ability were confirmed using FTIR- Fourier-transform infrared spectroscopy.

**Keywords:** *Photocatalysis, Methyl-orange, Layered double hydroxides, Visible-light*

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