

PHOTOCATALYTIC EFFICIENCY OF LiInO_2 IN DEGRADATION OF ALPRAZOLAM FROM WASTEWATERS**Ljubica Đaćanin Far*¹, Tamara Ivetić¹, Svetlana Lukić-Petrović¹, Dragana Štrbac²,
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Abstract

Alprazolam is a widely consumed psychiatric pharmaceutical from the benzodiazepines group, that has been continuously introduced into the environment through wastewaters, being a potential risk to living organisms. Furthermore, alprazolam is highly resistant to photodegradation, with degradation half-time of 228 sunny days [1].

Lithium-indium oxide is a high density (5.9 g/cm^3), wide band-gap semiconductor with promising applications for scintillating detection of solar neutrinos as well as for efficient phosphorescence when doped with different rare earth ions. Here we report for the first time the photocatalytic efficiency of LiInO_2 powder, synthesized using a simple solid-state chemistry procedure at relatively low temperature of 700°C . Materials structure was examined by X-ray diffraction, that confirmed materials tetragonal structural form (space group: $I4_1/amd$) with no impurity phases. Optical band-gap of 3.99 eV was estimated from the diffuse-reflectance spectrum. Photocatalytic efficiency was examined under both simulated solar and UV radiation. Photodegradation kinetics showed LiInO_2 powder has a good potential for UV-activated degradation of alprazolam.

References

[1] V. Calisto, M.R.M. Domingues, V.I. Esteves, Photodegradation of psychiatric pharmaceuticals in aquatic environments - kinetics and photo-degradation products, *Water Res.* 45 (2011) 6097–6106