Production, Chracterization and Photocatalytical Kinetics of Sm- and Dy- doped $K_2La_2Ti_3O_{10}$ Semiconducting Thin Films

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Persistent organic chemicals are present as pollutants in wastewater effluent from industrial manufacturers and normal households, and in landfill leachates. They can be found in surface waters and ground water wells. In all cases they have to be removed to protect our water resources. Nowadays, the layered perovskite photocatalyst $K_2Ln_2Ti_3O_{10}$ (*Ln* = La, Sm, Dy) has attracted considerable attention due to its unique properties, for instance, optical properties, electrical transport properties, and especially its excellent photocatalytic activity. As a result of the literature researches, we see that the perovskite-type oxide, $K_2Ln_2Ti_3O_{10}$ was generally produced by solid state reaction, polymerization complex method and sol gel method. Furthermore, we recognize, it has not been reported any study about $K_2Ln_2Ti_3O_{10}$ thin film which is coated on Si(100) substrate. For this reason, in this study our aim is produced $K_2Ln_2Ti_3O_{10}$ thin films by sol gel method for photocatalytic applications. The structural properties of the films were characterizated by XRD, SEM, DTA technics. The photocatalytic activity of these catalysts was studied under visible light irradiation. The effect of different dopants on degradation ratio of methylene blue, remazol red and ocean marine in industrial wastewater was evaluated. The highest ratio was observed for Sm- doped $K_2La_2Ti_3O_{10}$.

Keywords: Sol-gel technique, Photocatalytic, $K_2La_2Ti_3O_{10}$, Ocean marine