



INVITATION TO THE GRADUATE PHYSICS SEMINAR

Sol-gel preparation and photocatalysis of titanium dioxide and its use for removal of residual pharmaceuticals from aqueous systems

Lidija Sinovčič

Monday, 6.12. 2010 at 16:00

Seminar room, University of Nova Gorica in Ajdovščina, Vipavska

11c, 5270 Ajdovščina

Abstract

Over the past few years, pharmaceuticals are considered as an emerging environmental problem due to their continuous input and persistence to the aquatic ecosystem even at low concentrations. Pharmaceutical compounds such as antibiotics, antipyretics, cytostatic drugs, hormones etc., have been detected in sewage effluents, surface and ground water and even in drinking water. To avoid undesired accumulation of drugs in aquatic environments, development of powerful oxidation techniques make big role.

In order to cleanse water so-called Advanced oxidation processes (AOPs) have been developed. AOPs are technologies based on the intermediacy of hydroxyl and other radicals to oxidize recalcitrant, toxic and non-biodegradable compounds to various by-products and eventually to inert end-products. The aim of these methods is to mineralize the pollutants to CO₂, H₂O and mineral acids and salts. Titanium dioxide photocatalysis belongs to the group of AOPs and has been studied over the last 20 years. TiO₂ is used as a photocatalyst due to the strong oxidizing power of its holes, high photostability and redox selectivity. Compared to the other methods it has some advantages, but on the other hand there are also some drawbacks which retard its transmission to the industrial scale level.

The environmental applications of AOPs are numerous, including water and wastewater treatment (removal of organic and inorganic pollutants and pathogens), air pollution abatement and soil remediation. AOPs are applied for the abatement of pollution caused by the presence of residual pharmaceuticals in waters for the last decade.

Seminar is mandatory for graduate students of Physics and Material Characterization!