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## Photocatalytic decomposition of a nonionic detergent

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The newer chemicals that appears nowadays can't always be treated with the current sewage treatment methods. Keeping the environmental aspects in mind, new procedures should be developed. Triton X-100 is one of the most widely applied man-made nonionic surfactants. This detergent is utilized as both household and industrial cleaning agent. Triton X-100 can hardly be degraded by biological treatment under anaerobic conditions, and even in aerobic systems it can be just partly mineralized. Thus, it can reach natural waters, damaging various living organisms there. Hence, application of a more efficient degradation method is indispensable for the total mineralization of this surfactant. A possible solution of this problem is the application of heterogeneous photocatalysis. It is an advanced oxidation process that uses UV irradiation to form highly reactive radicals on the surface of a semiconductor catalyst.

We have thoroughly examined the photocatalytic degradation of Triton X-100 under various circumstances. The process was monitored by following the spectral changes, the organic carbon content, and the actual concentration (UHPLC method).

It has been established that Triton X-100 could be mineralized by TiO<sub>2</sub> mediated heterogeneous photocatalysis. However, one obstacle to the in field use is that if the catalyst is used in slurry form, the catalyst separation from the liquid phase is difficult and makes the technology more expensive. This problem can be eliminated if the catalyst is immobilized. We managed to create a foil catalyst from poly(vinyl-alcohol) and Degussa P25 TiO<sub>2</sub> which is capable of breaking down the model compound.

### Biography

Péter Hegedűs has completed his M.Sc. in Environmental Engineering at the age of 25 years from University of Pannonia. He is a first year PhD student at University of Pannonia Department of General and Inorganic Chemistry. His subject is: The preparation and characterisation of immobilised photocatalyst, and application for the degradation of pollutants.

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