Toetab TÜ ja TTÜ doktorikool "Funktsionaalsed materjalid ja tehnoloogiad" (FMTDK)

ESF projekt 1.2.0401.09-0079

AQUEOUS PHOTOCATALYTIC OXIDATION OF SELECTED ORGANIC POLLUTANTS USING CARBON-CONTAINING TITANIA

Deniss Klauson[1], Olga Budarnaja [1], Kristina Stepanova[1], Marina Krichevskaya[1], Sergei Preis[2]

[1]*Department of Chemical Engineering, Tallinn University of Technology, Estonia,* [2]*Department of Chemical Engineering, Lappeenranta University of Technology, Finland*

e-mail: deniss.klauson@ttu.ee

This work focuses on aqueous photocatalytic oxidation (PCO) of several organic pollutants, namely of a widely used fuel oxygenate, methyl-*tert*-butyl ether (MTBE), *p*-toluidine and phenol. Sol-gel prepared carbon-containing titania, active in visible light, were used as the photocatalysts. By varying the calcination temperature, several catalysts were prepared, and their activity in degradation of the abovementioned substances was compared to that of widely used commercial photocatalyst, Degussa P25. With MTBE and p-toluidine, the performance of C-TiO_2 with visible light was similar to that of commercial one with UV, and even surpassing that. In case of phenol, however, the performance of both Degussa P25 and carbon-containing titania was fairly inadequate. Along with the experiments with artificial light sources, several experiments using natural solar irradiation were undertaken.