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# Photocatalytic Degradation of Produced Water Hydrocarbon of an Oil Field by Using Ag-Doped $TiO_2$ Nanoparticles

**Authors :** Hamed Bazrafshan, Saeideh Dabirnia, Zahra Alipour Tesieh, Samaneh Alavi, Bahram Dabir

**Abstract :** In this study, the removal of pollutants of a real produced water sample from an oil reservoir (a light oil reservoir), using a photocatalytic degradation process in a cylindrical glass reactor, was investigated. Using $TiO_2$ and Ag-$TiO_2$ in slurry form, the photocatalytic degradation was studied by measuring the COD parameter, qualitative analysis, and GC-MS. At first, optimization of the parameters on photocatalytic degradation of hydrocarbon pollutants in real produced water, using $TiO_2$ nanoparticles as photocatalysts under UV light, was carried out applying response surface methodology. The results of the design of the experiment showed that the optimum conditions were at a catalyst concentration of 1.14 g/lit and pH of 2.67, and the percentage of COD removal was 72.65%.

**Keywords :** photocatalyst, Ag-doped, $TiO_2$, produced water, nanoparticles
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