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Semipilot waste water treatment by photocatalysis

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Abstract

In the recent several years, heterogeneous photocatalysis has evoked a great interest for the treatment of various types of organic contaminants found in wastewater or air. Endocrine disruptors (EDCs) presented at wastewater pose the real threat to the multicellular organisms. EDCs belong to the group of chemical substances disrupting the hormonal indication of vertebrates and thereby they could encroach on the organism function. To the group of endocrine disruptors belong surfactants, softeners, fungicides, insecticides and some kinds of medications and hormonal contraception. They are commonly presented not only in the waste water but also in the natural water. Unfortunately, conventional methods of water and sewage treatment are not completely effective in removing of the estrogenic substances. The necessity of finding the alternative solutions leads to development and use of the new technologies. Photo-catalysis using semiconductor particles have found increasing interest to solve the endocrine disruptors remove problems.

This study is focused on verification of the EDCs degradation by photocatalytical process in the specially designed pilot plant photo-reactor with immobilized TiO_2 . The real waste water and the simultaneous water with 17- α -ethinyl estradiol and 4-nonylphenol as representative EDCs were tested. In this work the water decontamination with various concentrations of endocrine disruptors in the two types of reactors; batch and plug flow arrangement were also studied.

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