

Removal some endocrine-disrupting compounds by N-doped BiOBr nanoparticle under solar light

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Some endocrine-disrupting compounds like 17β -estradiol, 17α -ethinylestradiol and 4-tert-octylphenol was removed from the surface waters using the N-BiOBr nanocomposite prepared under laboratory conditions. N doping on BiOBr improved the specific surface area and the photocatalytic activity of N-BiOBr. This phenomenon also decreased excessively the acute and chronic toxicity originating from the 17β -estradiol, 17α -ethinylestradiol and 4-tert-octylphenol. The effects of N percentage removals of the removals of endocrine-disrupting compounds and activity on N-BiOBr semiconductor was researched. The effects of N-BiOBr nanocomposite concentrations (0,5, 1, 1,5 and 2 mg/L), the effects of N percentages (2%,4%,6%,10%,15%) the effects of sun light power (1, 2, 4, 7 and 9 W/m²) and contacting times (10, 20, 30 and 40 min) on the of mineralization of endocrine-disrupting were studied. The toxicities performed by V. Fischeri and D. magna showed that the toxicities decreased from 98% to 8% at N-BiOBr nanocomposite concentration of 1,5 mg/l, at a N percentage of 10% after a sun light power of 4 W/m² and after 30 retention time under sunlight. By doping BiOBr with N an effective photocatalytic removal process was detected. Under optimized conditions; 17β -estradiol, 17α -ethinylestradiol and 4-tert-octylphenol were photocatalytically removed with yield as high as 99%, 98% and 97%, respectively.

Keywords: N-doped BiOBr, Photocatalysis, Endocrine-disrupting compounds, 17β -estradiol, 17α -ethinylestradiol, 4-tert-octylphenol.

Biography

Delia Teresa Sponza is currently working as a professor at Dokuz Eylül University, Department of Environmental Engineering. Scientific study topics are; Environmental engineering microbiology, Environmental engineering ecology, Treatment of fluidized bed and activated sludge systems, Nutrient removal, Activated sludge microbiology, Environmental health, Industrial toxicity and toxicity studies, The effect of heavy metals on microorganisms, Treatment of toxic compounds by anaerobic / aerobic sequential processes, Anaerobic treatment of organic chemicals that cause industrial toxicity and wastewater containing them, Anaerobic treatability of wastewater containing dyes, Treatment of antibiotics with anaerobic and aerobic sequential systems, Anaerobic and aerobic treatment of domestic organic wastes with different industrial treatment sludges, Treatment of polyaromatic compounds with bio-surfactants in anaerobic and aerobic environments, Treatment of petrochemical, Textile and olive processing industry wastewater by sonication, Treatment of olive processing industry wastewater with nanoparticles and the toxicity of nanoparticles. She has many international publications.

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