The Photocatalytic Degradation of .-ethynylestradiol (EE2) and Related Estrogens

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Endocrine disrupting chemicals (EDCs) are a group of chemicals that interfere with the function of the endocrine system of humans and wildlife by inhibiting hormonal synthesis and metabolism (L. Barreiros et al. 2016). EDCs are becoming an even more imminent issue to the environment because they are introduced to water systems via human excretion and are incompletely removed by wastewater treatment plants (WWTPs) causing their bioaccumulation in aquatic environments and subsequent entrance into the food chain.

Estrogens of synthetic and natural origin contribute to the EDCs that enter water systems. -estradiol (E2) and .-ethynylestradiol (EE2) are two EDCs with higher endocrine disruption potency (L. Barreiros et al. 2016). EE2 is a synthetic estrogen derived from the natural estrogen E2 and mostly used as birth control (Diamanti-Kandarakis et al. 2009). The presence of E2 and EE2 in the HQYLURQPHQW KDV EHHQ DVVRFLDWHG ZLWK reproductive fitness and an increase of breast and testicular cancer in humans (L. Barreiros et al. 2016). These estrogens have the potential to bioaccumulate and enter the food chain hence the European Union adding E2 and EE2 to their list of emerging aquatic pollutants included in their Water Framework Directive. To alleviate the bioaccumulation of estrogens VXFK DV EE2 DQG E2 removal of... DQG ZDV ... Photocatalytic degradation is a promising technique for estrogen removal from water systems.

3KRWRFDWDO\VWV DUH VROLG SDUWLFOHV WKDW GHJUDGH RUJD... WKH GHJUDGDWLRQ SURGXFWV ... water. Most work has been directed at titanium dioxide (TiO_2) DV DQ HQYLURQPHQWDO FRQWDPLQ... photocatalysts are being explored with the goal of more rapidly or more completely degrading contaminants. A newer photocatalyst is bismuth oxychloride (BiOCl).