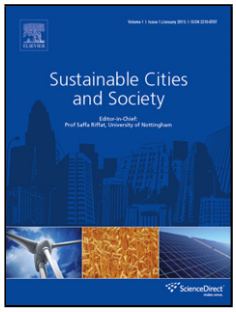


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PII: S2210-6707(16)30195-0
DOI: http://dx.doi.org/doi:10.1016/j.scs.2016.08.004
Reference: SCS 476

To appear in:

Received date: 8-2-2016
Revised date: 19-7-2016
Accepted date: 2-8-2016

Please cite this article as: Mirzaei, Amir., Chen, Zhi., Haghighat, Fariborz., & Yerushalmi, Laleh., Removal of pharmaceuticals and endocrine disrupting compounds from water by zinc oxide-based photocatalytic degradation: A review.*Sustainable Cities and Society* http://dx.doi.org/10.1016/j.scs.2016.08.004

# Removal of pharmaceuticals and endocrine disrupting compounds from water by zinc oxide-based photocatalytic degradation: A review

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**Highlights**

- The effects of catalyst and ECs concentration, catalyst structure, pH, water matrix, presence of $H_2O_2$ and air bubbling on the photo-degradation efficiency have been reviewed.
- ZnO is an effective catalyst for harvesting a wide range of wavelengths that emerging water contaminants can be degraded by ZnO in photocatlytic processes.
- ZnO has the advantage of low cost, nontoxicity, chemical stability and reusability as a catalyst in photo-degradation.
- Synergistic effects are reported by combining ultrasound and photo-degradation.

**Abstract**

The detection of pharmaceuticals and endocrine disrupting compounds (EDCs), known as emerging contaminants (ECs), in the environment has attracted growing concern due to their toxicity and potential hazard to the ecosystems and humans. These contaminants are consumed at high quantities worldwide and they are released deliberately or accidentally into the water resources. The conventional treatment technologies that use biological processes cannot effectively remove these contaminants. Therefore, the development of efficient and sustainable removal methods for these emerging contaminants is essential. Photocatalytic removal of emerging contaminants by using zinc oxide catalyst (ZnO) is a promising process due to the unique characteristics of this catalyst such as absorption of a larger fraction of the solar spectrum, wide band gap, biocompatibility, non-toxicity and low cost. Recently, a considerable effort has been made to improve the photocatalytic performance of ZnO by doping with elements, optimizing preparation methods, and using nano-ZnO. In addition, the efficiency of