Title:	Recent advances in the elimination of persistent organic pollutants by photocatalysis
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Keywords:	Organic pollutants Photocatalysis
Issue Date:	2022
Publisher:	Frontiers Media
Citation:	Frontiers in Environmental Science, 10(1), 872514
Abstract:	The non-ending needs of growing human population are being met by rapid industrialization and globalization, which have nowadays become an indispensable component of growth. Although these activities have led to phenomenal growth of the human civilization, at the same time, they have resulted in severe environmental pollution by discharge of highly toxic waste. This waste is severely detrimental not only for the environment but also for the health of the human population. Among different classes of pollutants, one being considered as one of the highly toxic ones is that of persistent organic pollutants (POPs). Advanced oxidation technologies (AOTs) play a major role in the degradation of pollutants by converting organic pollutants into CO2, H2O, and mineralized inorganic ions. AOTs include UV-based photocatalysis, ozonation, electrochemical oxidation, and Fenton and Fenton-like processes There are some difficulties and challenges associated with AOT, such as being highly capital intensive and high consumption of energy. To overcome these bottlenecks, photocatalytic degradation is a promising method that uses solar energy for the degradation of such pollutants. Photocatalysis is further classified into homogenous and heterogenous photocatalysis. As a part of heterogenous photocatalysis, semiconductor photocatalysts have received great attention; but because of their drawbacks such as the recombination of the electron/hole pair, low adsorption rate, and low surface area coverage, nanotechnology was considered for bringing a novel and enhanced remediation photocatalysis process. To this end, the designing of a more efficient photocatalyst by modifying morphology, composition, and structure and reducing toxicity is the need of the hour for the abatement of environmental pollutants. This review focuses on the degradation and removal of highly toxic persistent organic pollutants by using photocatalytic degradation with a detailed account of the various pollutants, their degradation mechanism, process shortcomings, remedial measures, and future prospects.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.3389/fenvs.2022.872514 (https://doi.org/10.3389/fenvs.2022.872514) http://hdl.handle.net/123456789/4871 (http://hdl.handle.net/123456789/4871)
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