

# Halides and oxyhalides-based photocatalysts for abatement of organic water contaminants – An overview

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## Abstract

Recently, halides (silver halides, AgX; perovskite halides, ABX<sub>3</sub>) and oxyhalides (bismuth oxyhalides, BiOX) based nanomaterials are noticeable photocatalysts in the degradation of organic water pollutants. Therefore, we review the recent reports to explore improvement strategies adopted in AgX, ABX<sub>3</sub> and BiOX (X = Cl, Br and I)-based photocatalysts in water pollution remediation. Herein, the photocatalytic degradation performances of each type of these photocatalysts were discussed. Strategies such as tailoring the morphology, crystallographic facet exposure, surface area, band structure, and creation of surface defects to improve photocatalytic activities of pure halides and BiOCl photocatalysts are emphasized. Other strategies like metal ion and/or non-metal doping and construction of composites, adopted in these photocatalysts were also reviewed. Furthermore, the way of production of active radicals by these photocatalysts under ultraviolet/visible light source is highlighted. The deciding factors such as structure of pollutant, light sources and other parameters on the photocatalytic performances of these materials were also explored. Based on this literature survey, the need of further research on AgX, ABX<sub>3</sub> and BiOX-based photocatalysts were suggested. This review might be beneficial for researchers who are working in halides and oxyhalides-based photocatalysis for water treatment. © 2022 Elsevier Inc.

## Author keywords

AgX; BiOX; Nanocomposites; Organic pollutants; Perovskite halides; Photocatalysts; Water treatment