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Editorial Note on Photocatalytic Degradation of Plastics

Editorial

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Plastics and plastic-based materials are a cause of concern due to their huge production, usage, and disposal in the environment. The discharged plastics disintegrated into small fragments through the action of biotic and abiotic factors. Plastics can be characterized into different groups based on their size such as mega plastics (size > 1 m), macroplastic (> 2.5 cm), mesoplastics (> 5mm), and microplastic (< 5 mm) [1, 2]. The small size and high surface area of microplastics (MPs) make them available as food for living organisms [3]. Ingested MP's effect on excretion, metabolism, reproduction, digestion, and growth [4]. In order to control microplastic pollution, photocatalysis has gained remarkable attention due to its green, eco-friendly, and sustainable approach. Photocatalytic degradation provides a cost-effective method for the treatment of emerging contaminants in the environment. Basically, photocatalysis is a kind of catalysis that results in the change of photoreaction- a chemical process in which one or more reacting species absorb light by a catalyst that participates in the reaction without being consumed. Till now, numerous attempts have been made to explore and modify the photocatalytic material. Among the used materials, titanium dioxide (TiO_2) and modified TiO_2 have been widely used for the degradation of MPs and other emerging contaminants [5]. Significant degradation of MPs was noticed through modified TiO_2 nanoparticle film and the weight loss was about 98% degradation of PS and PE while the performance for pure TiO_2 was 69% [6]. However, this efficient activity was observed only under UV light which is a limited portion of sunlight. Meanwhile, there are some other used materials such as bismuth oxychloride (BiOCl), zinc oxide (ZnO), and $NiAl_2O_4$ for plastic degradation whereas their photocatalytic performance is less as compared to TiO_2 [7]. Future work should improve the photocatalytic material and its performance for plastic degradation, especially under visible light irradiation.

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