Performance evaluation of dye wastewater treatment technologies: A review

H.M. Solayman [a], Md. Arif Hossen [b c], Azrina Abd Aziz [a], Noor Yahida Yahya [a], Kah Hon Leong [d], Lan Ching Sim [e], Minhaj Uddin Monir [f], Kyung-Duk Zoh [g]

[a] Faculty of Civil Engineering Technology, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

[b] Faculty of Chemical and Process Engineering Technology, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

[c] Center for Environmental Science & Engineering Research, Chittagong University of Engineering and Technology (CUET), 4349 Chattogram, Bangladesh

[d] Department of Environmental Engineering, Faculty of Engineering and Green Technology, Universiti Tunku Abdul Rahman, 31900 Kampar, Perak, Malaysia

[e] Department of Chemical Engineering, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, 43200 Kajang, Selangor, Malaysia

[f] Department of Petroleum and Mining Engineering, Jashore University of Science and Technology, 7408 Jashore, Bangladesh

[g] Department of Environmental Health Sciences, School of Public Health, Seoul National University, Seoul 151–742, South Korea

ABSTRACT

Dye wastewater released from several dyes induced industries are harmful towards the living, non-living environment and human. Consequently, existence of dye in water bodies is becoming a rising concern to environmentalists and citizens. Dye wastewater should be treated prior to release in an open water body to minimize its negative impacts. A long term sustainable and efficient treatment methods should be established to reduce and overcome the impacts. Although there have been significant advances in the management and treatment of such effluent using physical, chemical and biological methods. However, due to lack of information on effective dye removal methods, it is difficult to decide on a single unique technique that resolves the prevailing dye wastewater. Therefore, this paper reviews recent research on various (physical, chemical, biological, advanced oxidation process (AOPs) and hybrid) dye removal methods to compare efficiency, evaluation performance, merits and demerits. Among the existing methods, most of them have a common disadvantage which is the generation of secondary pollutes, takes long time and costly. This paper especially highlights AOPs method for dye removal as these are known as one of the promising and most effective dye removal techniques these days. This paper also suggests the application of AOPs methods possess the best performance in terms of faster dye removing as well as cost effective, time oriented and environmentally friendly. Additionally, this paper addressed the difficulties and future prospects of this emerging method that links to sustainable development.

KEYWORDS

Advanced oxidation process; Dye; Environmental remediation; Photocatalytic treatment; Wastewater treatment techniques

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