A REVIEW ON THE PHYSICOCHEMICAL PROPERTIES OF PEROVSKITE AS CATALYSTS FOR WATER AND WASTEWATER TREATMENT

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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SUPERVISOR'S CERTIFICATION

I declared that I read this thesis and in my point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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ABSTRACT

The main objective of this study is to review the physico-chemical investigations of perovskite catalyst on water and wastewater treatment. Advanced Oxidation Process (AOP) method treats the organic contamination effluent from industry that uses organic components or elements by generated highly oxidizing hydroxyl radicals (HO.). The general formula of perovskite catalyst is ABO_3 where A-site is a type of rare earth metal while B-site is a transition metal which known to be heterogeneous catalyst that help to degrade the organic effluent under dark ambient conditions. This comparative study compares the performance of catalytic activity of perovskite catalyst based on its physicochemical properties. The scope of work on overall paper determine the percentage of degradation of organic pollutants which correlated to the perovskite's physicochemical properties. The research methodology used the data collection and analyzed them in the previous study to fulfill the research on the study by putting together all notable related journals, past studies and research works done. Therefore, the study of perovskite catalyst is analyzed by using scanning electron microscopy (SEM), Transmission Electron Micrographs (TEM), X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), thermogravimetric analysis (TGA). As a result, perovskite catalyst is very effective in degrading methyl orange under dark ambient condition from low 10 ppm to high 100 ppm concentrations between 20-90 minutes, thus generating electrons which reacted with dissolved O_2 in the solutions to yield reactive species such as HO• for further degradation and mineralization. The perovskite catalyst has an active surface of catalyst that can help fasten the degradation of organic in wastewater by adsorption of organic onto the active surface of perovskite catalyst. Therefore, it is considered stable under the oxidative conditions and their thermal stability was better for the possible used on organic wastewater treatment.