SYNTHESIS OF GO-ZnO VIA IMPREGNATION METHOD FOR FLUORIDE REMOVAL IN WASTEWATER

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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 work, unless otherwise indicated or acknowledged 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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We declared that we read this thesis and in our 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

Fluoride is one of the essential elements for human health, which is beneficial with low concentration. However high concentration of fluoride in wastewater discharge from various industries is threatening the environment due to its hazardous effects and properties. There are various literature studies that have been carried out for the fluoride removal using different types of adsorbents. This study aims to develop an efficient modified graphene oxide as an adsorbent for fluoride removal in wastewater. The specific objectives of this study are to study the effect of synthesis parameter of GO-ZnO adsorbent via impregnation method for fluoride removal which are temperature, time, and ratio of GO to ZnO. The ratio, temperature, and time that give a highest adsorption capacity and percentage removal are 5:1, 45ºC and 60 minutes respectively. The highest value of adsorption capacity obtained from the fluoride removal is 55.5 mg/g. and the highest percentage removal is 37%. The functional group contain in the GO/ZnO are hydroxyl group (O-H), C=O group, aromatics group, carboxyl group (C-O), epoxy group and alkoxy group. This functional group affects the fluoride adsorption due to the bonding of fluoride ion to the functional group. The intensity or the percentage transmittance is change where the reaction was occurred at the peak.