

Thesis Title	Application of Chemical and Biological Process for Treatment of Stillage
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Abstract

The experiments were carried out by using the combined system between chemical and biological processes for treating the wastewater from alcohol factories (molasses wastewater). Two types of molasses wastewater were used in this study, were stillage and molasses wastewater from anaerobic pond of wastewater treatment plant (APW). The molasses wastewater samples were collected from Sangsom alcohol distillery factory, Sampran, Nakhonpatom and Thai Alcohol, Bang-len, Nakhonpatom.

The results showed that when the stillage of Sangsom Alcohol distillery factory were treated with FeCl_3 , Alum and CaO , the color removal efficiencies were 90.0%, 89.0% and 93.0% respectively. On the other hand, when the APW were treated with FeCl_3 , Alum and CaO , the color removal efficiencies were 98.7%, 97.5% and 93.6% respectively. From all the results above, we could conclude that CaO and FeCl_3 were suitable for removing color substances from stillage and APW, respectively.

For improving of color removal efficiency, the wastewater was aerated and added with sludge before chemical treatment process, the results showed that when the wastewater was aerated with sludge, the color intensity of the waste water was decreased. For example, the color intensity and COD in stillage and APW were reduced about 45.2% and 73.6%, 9.8% and 94.2%, respectively.

By the Gel Filtration Chromatography, the stillage after aerated with sludge for 96 hrs , some large molecular weight of color substances were adsorbed by sludge . But in the case of APW, the small molecular weight of color substances were adsorbed by sludge. It might be the nutrients and physical condition in the APW was not suitable for sludge to remove the color substances. However, the COD of both wastewater could be adsorbed by sludge.

The stillage and APW samples after aerated with the sludge for 96 hrs were treated with CaO and FeCl₃, respectively, the color removal efficiency were 97.3% and 96.6%, respectively. It might be the effects of sludge for improving the color removal efficiencies in the chemical treatment step such as changing of structure or size of molecule of color substance in molasses wastewater.

Keywords : Decolorization / Stillage / Molasses wastewater / Coagulation / Molasses wastewater treatment