

**CURRENT RESEARCH
AND DEVELOPMENT IN
BIOTECHNOLOGY
ENGINEERING
AT IIUM**

VOLUME I

Editors:

Suleyman Aremu Muyibi
Mohammed Saedi Jami
Zaki Zainudin



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(VOLUME I)

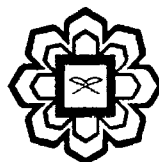
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**Department of Biotechnology Engineering
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EFFECT OF HYDROGEN PEROXIDE ON SETTLEABILITY AND FILTERABILITY OF SLUDGE FROM DRINKING WATER TREATMENT PLANT

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ABSTRACT

The performance of hydrogen peroxide as a good conditioner and remover of heavy metals from drinking water treatment plant sludge is investigated. The unique characteristics of hydrogen peroxide (H_2O_2) significantly supported the performance. The settleability and filterability of sludge were analyzed for performance of hydrogen peroxide for sludge treatment. Sludge volume (SV), sludge volume index (SVI), specific cake volume, color and odor of the sludge were improved by hydrogen peroxide compare to polyacrylamide. From the results obtained, by using hydrogen peroxide, the sludge volume and sludge volume index decreased greatly, due to high porosity, as well as changes in the structural and size of the sludge. A heavy metal also was reduced. The major parts of free and interstitial water were released because hydrogen peroxide and thus reduced the volume of particles. The sludge composition and reduced in lower hydration of the sludge cake after filtration, as compared to the non-conditioned sludge.

Keywords: hydrogen peroxide, treatment water sludge, sludge volume, sludge volume index, specific cake volume.

INTRODUCTION

Drinking-water treatment sludge (DWTS) is a by-product generated during the production of drinking water where aluminium or iron based salts is used as coagulants to remove colour, turbidity and humic substances (Razali, 2007). It is known to be a poorly dewaterable material. Sludge is usually dewatered before disposal. Dewatered sludge still contains a significant amount of water, even with that moisture content, sludge no longer behaves as a liquid and can be handled as a solid material (Guirreine, 1998). Problems with sludge occur frequently related to sludge bulking, foaming and dispersed growth. Therefore, sludge dewatering is important to reduce liquid residuals and induce the amount of water treated by the system. It is noted that for every batch of sludge, it has its own properties and characteristics and different conditions. Several research works conducted on DWTS could be used for different applications. Moodley & Hughes (2006) studied the effects of polyacrylamide-derived water treatment sludge on the hydraulic conductivity, water retention evaporation of four contrasting South African soils and implications for land disposal. They found that large amount of DWTS would have to be applied in order to markedly change the