

Chemical Treatment of Municipal Wastewater Using Alum Sludge

Dae Yewn Shin, Ok Ran Moon, Mi Ran Yoon, Chang Wha Ro,

*Gong Unn kang , **Deok hyn Moon, **Dimitris Dermatas,

Dept.of Environmental Engineering Chosun Univ., Gwangju, Korea, 501-759,
dysin@chosun.ac.kr

*WonKwang Health Science College, Iksan, Korea
gukang@wkhc.ac.kr

**W.M.Keck Geoenvironmental Laboratory, Stevens Institute of Technology, Castle
Point on Hudson, Hoboken, NJ 070730, USA

ABSTRACT

Disposal of waterwork sludge is important problem in WTP(water treatment plant). Purpose of this study is treated municipal waste water chemically using sludge that is produced in waterwork plant by link to reutilize waterwork sludge. Municipal waste water that use in an experiment used is produced at C university, and is SS 220 mg/L, BOD 145 mg/L, COD 160 mg/L, T-N 52 mg/L and T-P 2.6 mg/L. Used Alum, polymer coagulant and coagulant aid (diatomite, powered activated carbon) as CaO, coagulant as alkaline aid by chemical treatment medicine. In case of does slow speed agitation and stations after pours waterwork sludge in sewage and alkaline aid and coagulant at rapidly mixing the colloidal creation speed is fast and fine colloids concentration was high but settling time is shortened a little and removal rate of pollutant improved by 60~99%.

1. INTRODUCTION

The Waterwork sludge is disposing of by landfill and ocean dumping method but occurred secondary pollution with leaching and offensive odor occurrence in occasion of land fill. And suitable disposal method should be established because is preparing legislation about ocean dumping prohibition from Maritime-Fisheries Affairs Ministry according to international agreement such as 1972 London agreement and 1996 revision protocol in the case of ocean disposal.

Disposal of waterwork sludge is important problem in WTP(water treatment plant).

Study about recycling of WTP sludge was not preceded study that is many domestically and exteriorly. Research possibility of material of construction, ceramic industry material, agriculture material in Korea Water Resources Corporation in domestic, studies about availability by navy material and ceramic industry material was achieved in Japanese Nagoya technology examination institute, Tokyo university Faculty of Engineering etc., and fundamental study about farmland scattering was achieved because the United States of America receives AWWA's study support in Pennsylvania state university, Virginia state university.

Purpose of this study is treated municipal waste water chemically using sludge that is produced in waterwork plant by link to reutilize waterwork sludge.

2. MATERIALS AND METHODS

1) Pouring occasion waterwork sludge

Used Alum, polymer coagulant and coagulant aid (diatomite, powered activated carbon) as CaO, coagulant as alkaline aid by chemical treatment medicine.

2) Municipal waste water that use in an experiment used is produced at C university, and is SS 220 mg/L, BOD 145 mg/L, COD 160 mg/L, T-N 52 mg/L and T-P 2.6 mg/L.

3) We used concentrating is exhausted to settling pond lower outlet use Alum as coagulant CaO, as alkaline aid that is waterwork sludge using in this study.

3. RESULT AND DISCUSSION

1) In case of pour waterwork sludge

Pour waterwork sludge in sewage and because fine colloids concentration is high in case of make politics after slow speed agitation, it takes long settling time and removal efficiency by pollutant displayed 20~70%.

2) In case of pour alkaline aid and coagulant

In case of does slow speed agitation and stations after pours waterwork sludge in sewage and alkaline aid and coagulant at rapidly mixing the colloidal creation speed is fast and fine colloids concentration was high but settling time is shortened a little and removal rate of pollutant improved by 60~99%.

3) In case of pour alkaline aid, coagulant and polymer coagulant

In case of pours waterwork sludge in sewage and alkaline aid and coagulant at rapidly mixing the colloidal creation speed is fast and fine colloids concentration

rose. In case of pour polymer coagulant at after this rapidly mixing, floc grew greatly, and settles instantaneously moment halt.

4) In case of pour coagulant aid (diatomite, powdered activated carbon), alkaline aid, coagulant and polymer coagulant

In case of do slow speed agitation after pours waterwork sludge in sewage and coagulant aid (diatomite), alkaline aid and coagulant at rapidly mixing the colloidal creation speed is very fast and fine colloids concentration rose very. In case of pour polymer coagulant after slow mixing, floc growth rate was very fast, and was settled instantaneously moment is deposited. BOD and COD concentration appeared less than 10% in case of pours and agitated powdered activated carbon separating clarified supernatant liquid.

4. REFERENCE

- 1) D. A. Cornwell, H. M. M, Koppers, "Slib, Schlamm, Sludge" AWWA, 1990.
- 2) D. B. George, S. G. Berk, V. D. Adams, et al., "Alum Sludge in the Aquatic Environment" AWWA, 1991.
- 3) H. A. Elliott, B. A. Dempsey, et al., "Land Application of Water Treatment Sludge: Impacts and Management" AWWA, 1990.
- 4) J. T. Novak, W. R. Knccke, et al., "An Assessment of Cropland Application of Water Treatment Residuals" AWWA, 1995.
- 5) Korea Water Resources Corporation, "Treatment of WTP Supernatant (□)" 1990
- 6) Korea Water Resources Corporation, "Disposal and Utility of Waterwork Sludge(□)" 1993.
- 7) Korea Water Resources Corporation, "Reduction of Waterwork Sludge" 1995.