Thesis Title	Study and Improvement of the Integrated Circuit Industrial Wastewater Treatment Plant by Physico-Chemical Process
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Abstract

Physico – chemical process was applied to remove heavy metals (copper, lead and nickle) from the integrated circuit industrial wastewater by controlling influent's conductivity and then adding ferric chloride or anionic polymers, i.e., Qmafloc 985, FA 40, KuritaC-3310 and Kurita C-0320S. This research was carried out to determine the optimal conditions and the effectiveness of the coagulant and each anionic polymers in treating of equalizing wastewater. The efficiencies of heavy metals removal as well as the cost of sludge disposal and chemical reagents for coagulation process were analyzed and compared to the existing wastewater treatment system any without control of influent's conductivity.

Kurita C-0320S was found to be the suitable anionic polymer in treating equalizing wastewater. The optimal condition was at the controlled influent's conductivity of 800 micromho per centimetre, pH 10.00 $\pm$ 0.05 and polymer dose 0.1 milligram per litre. After coagulation, heavy metals concentration in treating wastewater were less than the standard limits; however, heavy metals concentration in treating wastewater of the existing treatment system was occasionally found higher than those standard limit. The cost of chemicals and sludge disposal for wastewater treatment from Kurita C-0320S and ferric chloride, compared to that from the existing treatment system were 2.20, 6.12 and 20.95 baht per cubic meter, respectively. Moreover, this research was carried out for improving and arranging some part of the existing wastewater treatment system in order

to increase the removal efficiency of heavy metal sludge. The treated wastewater from coagulation was then passed through pressure sand filter, its effluent was pH adjusted before discharged to water resources. The results from this study indicated that this improved processes is effective in reducing heavy metals concentration in the effluent, whose concentration were under the standard limits.

Keywords : Wastewater Treatment / Physico-chemical Process / Heavy Metals / Integrated Circuit Industrial Wastewater