3736432 ENTM/M : MAJOR : TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT ;
M.Sc. (TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT)
KEY WORDS : BIOSORPTION/HEAVY METAL/SPENT BREWER'S YEAST
RAPEEPORN KUMRAT : BIOSORPTION OF HEAVY METAL USING SPENT BREWER'S YEAST . THESIS ADVISOR : AURAPIN EAMSIRI, Ph.D. , CHUENCHIT BOONCHIRD, Ph.D. 118 p. ISBN 974-663-302-3

This research was carried out to investigate removal of heavy metals from wastewater produced by the electronics industry through biosorption using spent brewer's yeast, *S. cerevisiae*. The experiments were set to study the factors effecting heavy metal removal efficiency by spent brewer's yeast comparatively with the cultivated brewer's yeast, namely initial pH of solution, heat treatment in yeast biomass. In addition, the effect of hop oil removal from spent brewer's yeast using an alkali solution was also studied. The study of heavy metals biosorption capacity was conducted heavy metal removal by batch experiments using synthetics, single metal and co-metal ions competition, and industrial wastewater. Experimental samples were analyzed using AAS for heavy metals and then data were statistically processed by ANOVA and DMRT.

The results revealed that biosorbent produced from spent brewer's yeast could remove nickel, copper and lead. Heat treatment in yeast biomass could increase only copper biosorption capacity. However, hop oil removal from cells could not increase any adsorption capacity. The biosorption capacity and removal efficiency of nickel, copper and lead depended on the initial pH of the solution, treatment of yeast cells and types of metals and co-metal ions competition in mixed solutions. The highest removal efficiency using *S. cerevisiae* appeared on lead (75%) and then gradually decreased to copper (70%) and nickel (60%) (Pb>Cu>Ni) at pH 4. While the efficiency of copper and lead at pH 3 and pH 5 were the same as at pH 4. In case of mixed solutions, an appropriate pH was 4 in which the biosorption capacity of both single and co-metals showed no difference. However, using electronics industrial wastewater at pH 4 the biosorption capacity of both yeast biomass and spent brewer's yeast were significantly decreased (>20% and 30%). A higher biosorption capacity of yeast biomass (~40%) than spent's brewer yeast (~20%) were appeared. From these results, it can be demonstrated that by using biosorbent the amount of both copper and lead from electronics industrial wastewater cannot be lowered than industrial standard.