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SARUTTAYA DHEERAPONGPAIBOON : REMOVAL OF MERCURY FROM WASTEWATER BY ELECTROLYSIS AND PRECIPITATION WITH SODIUM SULFIDE. THESIS ADVISOR : ASSIST. PROF.

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Removal of mercury from wastewater using two methods ; electrolysis for maximum mercury removal, followed by precipitating with sodium sulfide for further removal. Purity of mercury by electrolysis was compared to dental standard mercury. Electrolysis at voltage of 0.5-4 volt, in 1-5 hours and the concentration of wastewater after diluting with deionized water (at ratio of wastewater : deionized water 1:2, 1:4, 1:6, 1:8 and 1:10) were conducted to find an optimal condition. The result showed that concentration of mercury in solution decreased from 8,385 mg/l to 137 mg/l at 3 volts in 3 hours. At the sametime, the concentration of mercury in solution was minimum in range 55-60 mg/l at 1:6, 1:8 and 1:10 of wastewater : deionized water. Following electrolysis, wastewater was precipitated with sodium sulfide at various pH conditions and sodium sulfide amounts. Experiments indicated that precipitation at pH 8 with a sodium sulfide amount equal to theoretical calculations produces optimum condition for precipitation. This condition can reduce mercury concentration from 142 mg/l to 0.003 mg/l, which is lower than that of the effluent standard of 0.005 mg/l.

Mercury removed by electrolysis using the voltage of 3 volts in 3 hours had a purity of 99.99815% by weight, which is lower than the mercury for dental application standard (99.99905% by weight). Removal of mercury from wastewater by electrolysis and precipitation with sodium sulfide can reduce mercury concentration to below a limit of 0.005 mg/l, however, mercury removed by electrolysis is not suitable for use directly in dental applications. It must be subjected for further purification process.

ภาควิชา..... INTERDEPARTMENT

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