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Removal of lead ions (pb^{+2}) from a synthetic wastewater by electrocoagulationusing aluminum (Al) as a rotating electrode

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Abstract: The performance of the lead electrocoagulation process was tested for five major factors that affected the process which were: different initial lead concentration (200,300,400,500)mg/different applied voltage(2.5,5,7.5,and10)V, and distance between the electrode (2.3,2.8)cm. different rotational velocity of anode (0, 50,100, and 150) rpm, variable pH (5, 7, 9, and 11) and time(5,10,15,20,25,30).The results showed that the removal rate of lead (removal efficiency) decreased with increasing concentration at concentrations (200, 300,400and 500) mg/l. Also removal efficiency, increased with increased applied voltage and reach to a maximum efficiency value at 10V, but decreased with increasing distance ,while rotating anode velocity doesn't fix that is a stat with increased with low velocities (0-50)rpm and reached to higher efficiency at (100)rpm, while at high velocity(150-200)rpm the removal efficiency start in decrease gradually due to the destabilization of flocks that is formed While pH shows peak performance curve. It shall be the highest removal efficiency rate of acidic (7). The optimum removal efficiency of 99 % was achieved at concentration 200mg/l and at a voltage of 10V with 2.3cm spacing between the electrodes and rotational velocity= 100rpm and pH = 7,using (Al/St. St.) electrodes, within 20 min of operating time. The lead removal data has been used to find adsorption isotherm.
Keywords: Electrocoagulation, lead removal efficiency, Wastewater, rotating anode.

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