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Pilot-scale operation of electrocoagulation for removal of toxic metals

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Electrocoagulation is a water treatment method which can be used for removal of a wide range of contaminants, especially dissolved metallic ions via (co)precipitation processes. The method is an alternative method to standard chemical coagulation, which is one of the most common water and wastewater treatment processes. Whilst chemical coagulation is one of the commonly used procedure in industry, where soluble salts of Al or Fe are used (e.g. $\text{Al}_2(\text{SO}_4)_3$ and FeCl_3), in electrocoagulation (EC) precipitating agent (e.g. Al^{3+} , Fe^{3+}) is generated by corrosion of metallic electrodes made of aluminum or steel. The use of electrodes as a source of Fe or Al ions to solution, effectively replaces chemical dosing stations with more compact electrochemical reactors.

The process was tested in pilot-scale unit placed in movable container and operated in continuous regime. The results have shown that the removal efficacies are strongly dependent on the dose of coagulant, which is the most important and crucial parameters affecting performance of electrocoagulation and of course on other process parameters. It is also very reliant on contaminant content in treated effluent. An addition of flocculating agent was also tested on the improvements of process performance.

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