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Krystyník, Pavel
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TREATMENT OF INDUSTRIAL EFFLUENTS BY ELECTROCOAGULATION

Krystyník P.[1], Klusoň P.[1], Mašín P.[2], Kroužek J.[2]

[1]*Institute of Chemical Process Fundamentals of the CAS, v.v.i., Rozvojova 135/1, 165 02 Prague 6 Lysolaje, Czech Republic*
[2]*Dekonta a.s., Dretovice 109, 273 42 Stehelceves, Czech Republic*

Electro-coagulation is a water treatment method that can used for removal of a wide range of contaminants via (co)precipitation processes. It can be used as an alternative method to standard chemical coagulation, which is one of the most common water and wastewater treatment processes. Whilst chemical coagulation is the standard procedure in industry, where soluble salts of Al or Fe are used (e.g. $Al_2(SO_4)_3$ and $FeCl_3$), this can be replaced by an electrochemical alternative (EC) where the precipitating agent (e.g. Al^{3+}, Fe^{3+}) is generated by corrosion of metallic electrodes of aluminum or steel. The use of electrodes as the vehicle for delivery of Fe or Al ions to solution, effectively replaces chemical dosing stations with more compact electrochemical reactors.

Various types of contaminated water from three different industrial sites in Czech Republic were tested in half scale EC system operating in continuous regime (100 L/h). Treated types of water were following:

(i) Water containing high concentration of arsenic and enormous content of iron
(ii) Water containing thallium apart from common heavy metals
(iii) Water containing high concentrations of zinc and hexavalent chromium

The results have shown that the removal efficacies are strongly dependent on pH of treated effluent, the type of electrode, the dose of coagulant and other parameters. It is also very reliant on on on contaminant content in treated effluent. An addition of flocculating agent was also tested on the improvements of process performance.

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