

Electrocoagulation of a raw water of Ghrib Dam (Algeria) in batch using aluminium and iron electrodes

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ABSTRACT

Laboratory experiments were carried out to investigate electrocoagulation (EC) of Ghrib Dam's water (Algeria) in batch using aluminium and iron electrodes without addition of chemicals, without pH modification, and without agitation. The optimal conditions are an applied voltage of direct current of 8 V and a current density 74 A m^{-2} (0.35 A) during 45 min for both electrodes. The microbial pollution is completely removed by essentially electrical field whereas conductivity and turbidity are reduced at 27 and 85% respectively for Fe electrodes and 22 and 97% for Al electrodes by metallic cations. These results prove that water treatment by EC using Al electrodes (flotation) for low turbid water (7 NTU) is more convenient than Fe electrodes (sedimentation) for both turbidity and organic matter removal. A new parameter to be taken in consideration for EC reactor design the ratio r active volume on reactor volume which is full of water is introduced where the active volume is the active surface multiplied by the distance between the electrodes.

Keywords: Surface water; Drinking water; Electrocoagulation; Iron; Aluminium

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