Removal of heavy metals and suspended solids from shrimp culture wastewater in Bushehr province, using cold plasma technology

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Abstract:

The present work has been carried out to investigate the removal efficiency of active oxygen, produced by using APGP cold plasma sterilizer, on the heavy metals of Hg, Pb and Total Suspended Solids in discharge wastewater of Shif shrimp culture complex and Persian Gulf SPF shrimp research center in Bushehr province.

The maximum of removal efficiency for Hg and Pb were 66% and 74%, respectively, in 10 ppm samples. The removal efficiency for Hg and Pb in pilot phase in all studied samples were 100%. The maximum of removal efficiency for TSS was 76.3% in Persian Gulf SPF shrimp research center wastewater. The removal optimum time for all studied parameters was one hour. The results of variance analysis showed a negative and significant relationships between active oxygen and the concentrations of Hg, Pb and TSS (p-values <0.05).

The concentrations of Hg, Pb and TSS in the treated wastewaters with active oxygen were less than the Iranian Environmental Protection Organization (IEPO) regulations for discharge limit into surface water.

Keywords: Removal of heavy metals, Suspended solids, Cold plasma, Shrimp complex, Bushehr