

Comparison of Coagulation, Electrocoagulation and Biological Techniques for the Municipal Wastewater Treatment

Hesham Ahmad^{1*}, Walid K. Lafiz², Khaleel Abushgair³ and Jamal M. Assbeihat⁴

¹*Al-Zaytoonah University of Jordan, Department of Civil and Infrastructure Engineering, P.O. Box: 130 Amman 11733 Jordan.*

²*Al-Zaytoonah University of Jordan, Department of Civil and Infrastructure Engineering, at sabbatical leave from Al-Balqa Applied University, Department of chemical Engineering.*

³*Al-balqa Applied University, Department of Mechanical Engineering, Amman, Jordan.*

⁴*Al-balqa Applied University, Department of Civil Engineering, Amman, Jordan.*

**to whom all correspondence should be addressed, E-mail Address: h.ahmad@zuj.edu.jo*

Abstract

The present study provides comparative assessment of chemical coagulation, electrocoagulation (EC) and biological treatment for the removal of pollutants expressed in chemical oxygen demand (COD) and total suspended solids (TSS) from municipal wastewater for further reuse in agriculture. The performance of the electrocoagulation, chemical coagulation and biological are presented comparatively, as wastewater treatment technologies taken into consideration to reach above the minimum requirements of Jordanian standards, guidelines and regulations. The reduction efficiency of COD and TSS were 87 % and 93%, 78% and 98%, and 83% and 90% for biological treatment plant (BTP), coagulation large scale unit (CLSU) and electrocoagulation lab scale unit (ELSU), respectively. The treatment time to achieve these results was varied from 45 minutes to four hours for CLSU and BTP, respectively.

Keywords: coagulation; biological treatment; electrocoagulation; wastewater treatment; chemical oxygen demand (COD); total suspended solids (TSS)