



“Gheorghe Asachi” Technical University of Iasi, Romania



LIQUID WASTE MANAGEMENT METHODOLOGY –A WASTE-TO-ENERGY APPROACH

Lidia Kim, Georgeta Madalina Arama*

INCD-ECOIND Bucharest, 71-73 Drumul Podu Dambovitei, District 6, 060652, Bucharest, Romania

Abstract

The purpose of this paper was to sum up the most appropriate pretreatment methods for destabilizing the oil waste emulsions coming from metal surface processing operations. A three steps oil waste management pretreatment methodology was proposed considering the application of the waste hierarchy and end-of waste criteria in the spirit of circular economic concept. Our main objective was to valorize the high energy content of oil waste flows using low cost pretreatment methods. The obtained phase can be used as a fuel substitute decreasing this way the waste volume to be disposed knowing that according to the waste hierarchy recycling is better than burning and burning is better than landfilling. The obtained results showed for the recovered oil phases the following values for the determined relevant indicators: carbon content 50÷70%, humidity 20÷65%, ash content 4÷5 % and superior heating value 6800÷8800 Kcal/kg. The obtained results for the separated water phase were also encouraging: turbidity 20÷30 NTU (Nephelometric Turbidity Units) and COD (Chemical Oxygen Demand) 5000 ÷7000 mg/L. The low costs physical-chemical pretreatment proposed technologies brought the obtained results in line with other more expensive hybrid technologies presented in recent literature in the field making them more attractive for the implementation within a circular economic model.

Key words: circular economy, emulsions, waste, waste-to-energy

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*Author to whom all correspondence should be addressed: e-mail: madalina.arama@incdecoind.ro evmt@incdecoind.ro; Tel: 04.021. 410.03.77-246/0787507337; Fax: 04 021 410 05 75