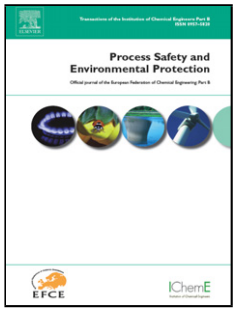


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Authors: H. Bakraouy, S. Souabi, K. Digua, O. Dkhissi, M. Sabar, M. Fadil

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# OPTIMIZATION OF THE TREATMENT OF AN ANAEROBIC PRETREATED LANDFILL LEACHATE BY A COAGULATION-FLOCCULATION PROCESS USING EXPERIMENTAL DESIGN METHODOLOGY

H.BAKRAOUY[(1)], S.SOUABI[(1)], K.DIGUA[(1)], O. DKHISSI[(1)], M. SABAR[(2)], M. FADIL[(3)]

[(1)] Engineering Laboratory of Water & Environment, Hassan II University, Faculty of Sciences & Techniques Mohammedia, Morocco

[(2)] Laboratory of industrial Techniques, Sidi Mohammed Ben Abdellah University, Faculty of Sciences & Techniques, Fez, Morocco

[(3)] Application Organic Chemistry Laboratory, Faculty of Sciences and Techniques, Sidi Mohamed Ben Abdellah University, Fez, Morocco

## ABSTRACT

Nowadays, landfill leachates are one of the most critical environmental issues faced by countries around the world. They result from the percolation of rain water through layers of solid waste, to which is added water from biochemical processes in waste's cells and water that comes from wastes themselves. They are therefore highly charged with organic and mineral matter, which requires treatment before discharge to the receiving environment. In recent years, many techniques have been developed for leachate treatment. In this study, landfill leachate selected comes from Rabat city's landfill. Landfill leachate is treatead by anaerobic combined with coagulation flocculation (CF) process, using ferric chloride as coagulant and a cationic polymer as flocculant. The leachate is characterized by high COD and $BOD_5$. The $BOD_5$/COD ratio is equal to 0.58±0.01, revealing that it is a young leachate with a very important biodegradability. The leachate was also loaded with phenolic compounds whose concentration reached 341.6±21.3 mg/L. The optimization of the doses of coagulant and flocculant was performed using factorial design of experiments. Optimal dosages obtained were: 4.4 g/L of coagulant and 9.9 mL/L of flocculant. Removal efficiencies reached: 89±6, 69±4.8, 94±1.3, 80±8.7 and 89±1.2 % for phenol, turbidity, color, COD and absorbance at 254nm (Abs 254nm) respectively.

*Keywords*: Landfill leachate, anaerobic pretreated**,** coagulation flocculation, factorial design of experiments, optimization, dosages.