

Thesis proposal

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<p>Scientific domain : chemical and environmental engineering</p> <p>Two major publications in the field proposed for the PhD :</p> <p>E. SINGLANDE, H. ROUX-de BALMANN, X. LEFEBVRE, M. SPERANDIO, Improvement of the treatment of salted liquid waste by integrated electrodialysis upstream biological treatment <i>Desalination</i>, (2006) 199, 64-66</p> <p>F. J. BORGES, H. ROUX-de BALMANN, R. GUARDANI Investigation of the mass transfer processes during the desalination of water containing phenol and sodium chloride by electrodialysis <i>J. of Membrane Science</i>, 325 (2008) 130–138</p>		
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<p>Description of the research work proposed for a PhD</p> <p>Title : Treatment of saline waste waters by integrated membrane processes</p> <p>Subject (short description):</p> <p>The treatment of waster waters with high salinity produced by chemical, pharmaceutical, food, textile industries, and increasingly during the sea water demineralisation by reverse osmosis (RO concentrates) is recognised as a challenging problem. Indeed, in such waste waters the oxidation of the organic matter is very difficult because high salt concentrations reduce the performance of biological as well as chemical treatment processes.</p> <p>The aim of this project is to investigate combined processes to improve the treatment of such waters, including a membrane pre-treatment, by electrodialysis for instance, before the oxidation step.</p> <p>An experimental study will be carried out with synthetic wastes, containing model organic pollutants, either biodegradable, like acetic acid, or bio recalcitrant, like phenol, and different mineral salts. The performances of the demineralisation ED step will be first studied. Then, the influence of the salt composition on the oxidation step will be investigated. Based on previous work, phenomenological models will be also adapted. Finally, both operations will be integrated in a single process. Thanks to an integrated approach, different scenarios will be investigated to optimize the combination with respect to different criteria.</p> <p>Such processes should be able to bring solutions to different problems, especially to that arising from the increasing production of brines, like those coming from the use of reverse osmosis for the production of drinking water.</p> <p>Keywords environment- waster water- membrane processes-</p>		