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# ON THE EFFECT OF THE OPERATING PARAMETERS FOR TWO-PHASE OLIVE-OIL WASHING WASTEWATER COMBINED PHENOLIC COMPOUNDS RECOVERY AND RECLAMATION BY NOVEL ION EXCHANGE RESINS

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## Abstract

Olive oil is produced by a technological procedure based on physical operations, without use of chemicals. This industry is concerned to make the whole process environmentally friendly, which includes the treatment of the wastewater produced in the mills. In the present work, the isolation, purification and recovery of high-added value phenolic compounds from two-phase olive-oil washing wastewater (OOWW) and the simultaneous effluent treatment by a 'green process' based on resins adsorption/ion exchange (strong-base anionic Amberlyst A26<sup>®</sup>, weak-base anionic Dowex 66<sup>®</sup> and non-ionic macroreticular Amberlite XAD4<sup>®</sup>) was studied. Results showed the resins performances were optimal at the raw effluent pH and ambient temperature conditions, thus no acidification or basification, nor cooling or heating, would be necessary: the effluent could be directly driven from the exit of the vertical centrifuges at the outlet temperature and raw pH to the proposed resins process, boosting the economic feasibility. The strong anionic resin ensured optimum results: upon 150 min maximum contact time and 60-80 g resin/L, a final treated effluent containing only 8.7 mg/L total phenolic compounds was obtained. The effluent could be partially discharged on suitable terrains or disposed to biological treatments, avoiding phytotoxicity or inhibition due to the phenolic content. The obtention of this concentrated pool of added-value antioxidant compounds for food, cosmetics, pharmaceutical and biotechnological industrial sectors could help counter-balance the economic feasibility of the reclamation process.

Keywords: Olive-oil washing wastewater, Ion exchange, Resins, Phenolic compounds, Wastewater reclamation, Sustainability.

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