

Implementation of Membrane Technology for the Isolation of the Olive Mill Wastewater Phenolic Content

*D. P. Zagklis, C. A. Paraskeva**

*Department of Chemical Engineering, University of Patras, GR 26504, Rion, Patras, Greece
Institute of Chemical Engineering Sciences, Foundation for Research and Technology, Hellas
(FORTH/ICE-HT), Stadiou Str., Platani, GR 26504, Patras, Greece*

**Department of Chemical Engineering, University of Patras, GR 26504, Rion, Patras, Greece
Email: takisp@chemeng.upatras.gr*

Olive Mill Wastewater (OMW) poses a serious environmental problem for the main production countries of olive oil, located in the Mediterranean basin. Large quantities of OMW are produced and because of its high organic and phenolic content, the treatment cost is quite high. The exploitation after the systematic purification of organic compounds with high added value from its content can surpass the treatment cost and result in profit, solving the problem of disposal. Ultrafiltration, Nanofiltration and Reverse Osmosis were implemented in line, in cross flow mode at pilot scale, for the isolation of simple phenolic compounds with high added value, in the RO concentrate. The NF membrane used was firstly characterized for the determination of its Molecular Weight Cut-off (MWCO), with the use of Polyethylene glycols (PEG) of different MW. Because of the high concentration needed in the RO concentrate, pressure pulses were implemented in the RO filtration, for the reduction of concentration polarization phenomenon that was hindering filtration. Through this process, the simple phenolic compounds were separated and further treated with additional physicochemical techniques like rotary evaporation and adsorption on ion exchange resin for their isolation.