

Abstract

Water Decontamination Hybrid Processes Using Photocatalytic Ultrafiltration Membranes [†]

Sorin Claudiu Ulinici ^{1,*}, Gabriela Baisan ¹, Grigore Vlad ¹, Adriana Popa ² and Dana Toloman ²

¹ I.C.P.E. BISTRITA S.A., 7 Parcului Str., 420035 Bistrita, Bistrita-Nasaud, Romania; gabibaisan@icpebn.ro (G.B.); vlad@icpebn.ro (G.V.)

² National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat St., 400293 Cluj-Napoca, Romania; adriana.popa@itim-cj.ro (A.P.); dana.toloman@itim-cj.ro (D.T.)

* Correspondence: sorin_ulinici@icpebn.ro

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Abstract: Environmental pollution is a major threat to natural ecosystems, human health, and a challenge for the scientific world to adapt to the many side effects of industrialization and development. The paper presents the results of research designed to configure innovative water depollution hybrid technologies that use advanced oxidation processes (photocatalysis) combined with membrane separation processes, with a synergistic action of degradation of organic pollutants and separation by ultrafiltration, with the special purpose of water treatment at the point of use (POU). The hybrid processes are based on the development of photocatalytic ultrafiltration membrane systems made on quasi-inert support (PVDF) that incorporate nanostructures based on carbon nanotubes (MWCNT) doped with metal oxides. The laboratory model for the evaluation of hybrid systems is presented. It incorporates the photocatalytic ultrafiltration system in an experimental reactor with automatic control and data acquisition for the analysis of scale processes. The tests performed create the premise of elaborating the design specifications of the processes and their integration in real-scale industrial technologies.

Keywords: hybrid water purification processes; ultrafiltration photocatalytic membranes; advanced oxidation processes

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