



“Gheorghe Asachi” Technical University of Iasi, Romania



REMOVAL OF EMERGING POLLUTANTS FROM AQUEOUS SOLUTION USING SOLAR HETEROGENEOUS PHOTOCATALYSIS: SPIRAMYCIN AND MANCOZEB MIXTURE

Nadia Chekir^{1*}, Nadia Aicha Laoufi², Fatiha Bentahar²

¹University of Science and Technology Houari Boumerdiene (USTHB), Faculty of Mechanical Engineering and Process Engineering, Laboratory of Recovery and Recycling of Matter of Sustainable Development, Bab-Ezzouar, 16111 Algiers, Algeria

²University of Science and Technology Houari Boumediene (USTHB), Faculty of Mechanical Engineering and Process Engineering, Laboratory of Transfer Phenomena, Bab-Ezzouar, 16111 Algiers, Algeria

Abstract

Photocatalysis is one of the future alternatives of the classic processes for wastewater treatment because of its low costs and effectiveness. Using UV light and a catalyst this process can be conducted until total mineralization. In this study, it has been applied a solar photocatalytic processes for the removal of a mixture consisting of two emerging pollutants Spiramycin (SPM) and Mancozeb (MCZ) in tubular reactor. The maximum percentage of SPM and MCZ removal reach more than 96%. The pollutant concentration ratio in the aqueous solution can be an important factor influencing the photodegradation kinetics. In the mixture solution, Mancozeb (MCZ) concentration was varied with keeping the same Spiramycin (SPM) initial concentration ($12\mu\text{mol L}^{-1}$). The results show that the presence of Mancozeb (MCZ) on excess in the solution influences significantly the Spiramycin degradation, which decreases considerably. The presence of *Mancozeb* acts as inhibit for the SPM photodegradation, this is due to the competition between these two molecules to be adsorbed on the catalyst surface. The degradation efficiency of SPM decreases in an equimolar mixture of SPM and MCZ from 95% to 68%.

Key words: co-degradation, emerging pollutants, Mancozeb, Spiramycin, solar photocatalysis

Received: July, 2020; *Revised final:* November, 2020; *Accepted:* December, 2020; *Published in final edited form:* February, 2022

* Author to whom all correspondence should be addressed: e-mail: nchekir@yahoo.fr; +213 558187179