

Title: Treatment of polluted water with Green Malachite oxalate using photodegradation and advanced oxidation processes.

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Summary:

The Malachite Green oxalate (GMox) is a synthetic dye very used in several fish farms in oriental countries that cause serious problems in polluted waters. In the last years, the use of chemicals procedures has been studied to reduce the environmental problems of organic compounds such as GMox.

In this project, a study of the degradation of GMox has been done with different chemical processes analysing the colour removal and the mineralization of the dye. The studied processes are photodegradation (PD) and advanced oxidation process (AOPs) such as photodegradation with H_2O_2 (PD- H_2O_2), Fenton (F), photo-Fenton (PF) and photo-Fenton with aromatic additives (PFA).

The study of the colour removal has been carried out by spectrophotometric measures where it has been observed how the PF and PFA in the best conditions were able to make an instantaneous discolouration of the dye. On the other hand, PD- H_2O_2 and F processes perform a 100% of colour removal in a few minutes. The discolouration with PD process is remarkable with a 25 % of colour removal with only UV-C light (200 nm to 280 nm).

The mineralization was quantified by organic total carbon (TOC) measures. We can observe how PF process get a 75% of mineralization in 100 minutes, much more than PD- H_2O_2 and F processes, where only reach 23% and 33%, respectively.

The results show us how all the studied AOPs processes are clean, simple and able to degrade complex organics compounds like GMox.

Keywords: Polluted water, Malachite Green oxalate, photodegradation, advanced oxidation process, colour removal, mineralization