



TREATMENT OF PHARMACEUTICAL EFFLUENTS BY HYBRID ADVANCED OXIDATION PROCESS

*A thesis submitted
in partial fulfilment of the requirements
for the degree of*

Doctor of Philosophy

by

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SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

Short Abstract of the Thesis is checked for correctness. Recommended for submission.

This work focuses on the degradation of pharmaceuticals synthetic and real industrial effluents by ozonation system. Three best-selling pharmaceuticals, naproxen, diclofenac, and ranitidine have been degraded by ozone in the presence of H_2O_2 . To analyze the mass transfer of ozone from gas to a liquid, coefficients for volumetric mass transfer were calculated in pure water. Probable mechanisms of their formation were predicted for all drugs. At pH 9 and 48 – 50 $mg\ s^{-1}$ ozone supply, all three drugs were completely removed in less than 10 min. For NPX, DCF, and RNT, degradation follows the pseudo-first-order reaction rate, with rate constants ranging from 0.043 to 0.0979 min^{-1} . A model had been developed to analyze the effect of operation parameters on the rate of degradation. Decarboxylation, dichlorination, and hydroxylation are the major mechanisms involved in the degradation process.