



Photolytic and photocatalytic degradation of febantel in aqueous media

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ABSTRACT

This research deals with photolytic (UV-C, 254 nm and UV-A, 365 nm) and photocatalytic degradation of anthelmintic drug febantel. In photocatalytic experiments, TiO₂ was used as a catalyst in the form of a nanostructured thin film. UV-C irradiation proved to be effective during photolytic and photocatalytic degradation. The most effective process proved to be photocatalytic degradation with UV-C radiation and febantel half-life time was 2.10 min. During the photocatalytic degradation process nine degradation products were detected. High resolution mass spectrometry data were used to propose degradation products structural formulae and corresponding degradation pathways. The main degradation processes are the hydroxylation of the phenyl ring of febantel and methoxyacetamide substituent reduction in febantel. Toxicity of the samples during photocatalysis was investigated using *Vibrio fischeri* bacteria. Samples showed increase in toxicity as the process advanced which can be attributed to the formation of methyl carbamate derivatives as the degradation products.

Keywords: Anthelmintics; Photocatalysis; Liquid chromatography; High resolution mass spectrometry; *Vibrio fischeri* toxicity

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