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## FATE OF METRONIDAZOLE UNDER SOLAR IRRADIATION

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### Abstract

Photodegradation caused by sun irradiation may be of major significance in the natural elimination process of pharmaceuticals and personal care products (PPCPs). The fate of metronidazole (MET) in surface water under solar irradiation was investigated. Several parameters affecting the photochemical degradation rate of MET were investigated, including the initial pharmaceutical concentration, continuous input and the presence of other pharmaceuticals like tinidazole (TNZ) with similar structure to MET as the analogue or amoxicillin (AMX) as non-analogue. The focus of the study was to evaluate the effect of the coexisting pharmaceuticals and continuous input on the photodegradation of PPCPs. The results showed that the photodegradation rate of MET became lower in the presence of TNZ. At the same time, the presence of AMX showed no effect on the photodegradation rate of MET. Besides, to elucidate the effects of continuous input on the photodegradation, a high concentration solution of MET with calculated volume of MET was added repetitively to the reaction solution under solar irradiation for 60 minutes. After 5 times of recovering concentration, the removal of MET decreased from 32.9% to 9.6%. The fact shows that the coexisting pharmaceuticals and continuous input effect on the photodegradation of MET obviously. Therefore, these factors must be taken into account in assessing the fate of PPCPs in the environment. In addition, the kinetic parameters such as quantum yields and rate constants were also determined.

*Key words:* kinetics, metronidazole, photodegradation, solar

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