

Ibuprofen removal by heterogeneous photocatalysis and ecotoxicological evaluation of the treated solutions

João P. Candido¹ · Sandro J. Andrade¹ · Ana L. Fonseca² · Flávio S. Silva¹ ·
Milady R. A. Silva¹ · Márcia M. Kondo¹

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Abstract Emerging contaminants including pharmaceuticals are a class of compounds that are causing great concern due to several environmental problems. Conventional water and wastewater treatments do not achieve high removal efficiencies for many of these drugs. Therefore, the present work investigated the removal of ibuprofen (IBP) by heterogeneous photocatalysis using TiO₂ irradiated with artificial UV light or solar radiation. The treated solutions were tested against *Daphnia similis* and *Raphidocelis subcapitata*, which are species commonly used as bioindicators of environmental conditions. The results indicated that IBP removal reached 92% after 1 h of treatment using artificial UV and 1000 mg L⁻¹ of TiO₂, which was the optimum catalyst concentration in the

range studied (20–1000 mg L⁻¹). TOC removal reached up to 78% after 60 min of treatment using TiO₂/artificial UV. Ecotoxicological bioassays indicated that the treated solutions had acute effects, with 30% immobilization of *D. similis* and 40% growth inhibition of *R. subcapitata*.

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✉ Márcia M. Kondo
mmkondo@unifei.edu.br

¹ Instituto de Física e Química, Universidade Federal de Itajubá, Av. BPS, 1303, 37500-903 Itajubá, MG, Brazil

² Instituto de Recursos Naturais, Universidade Federal de Itajubá, Av. BPS, 1303, 37500-903 Itajubá, MG, Brazil