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Investigation of photodegradation of Imidacloprid and Thiamethoxam in aqueous environment under UVA, UVB and sunlight exposure

Imidacloprid and Thiamethoxam are two type of neonicotinoid insecticides that are widely used for agricultural treatments. They are derived from nicotine and can damage the central nervous system of insects at very low dose and cause paralysis and death. The purpose of the study is to investigate the photodegradation of imidacloprid and thiamethoxam in natural water. The effects of light with differing wavelengths were examined using natural sunlight and single ultraviolet A (UVA) and ultraviolet B (UVB) light sources. HPLC water and groundwater have been used in the experiments. The results indicated that UVB played a key role in the photodegradation of imidacloprid and thiamethoxam while the effects of visible and UVA lights were negligible. The degradations of imidacloprid and thiamethoxam under all the light sources followed the first-order kinetics. The half-life of imidacloprid in groundwater when exposed to UVB was found to be 86 minutes while that of thiamethoxam in hplc water was found to be 139 minutes.

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