



Determination of the Oxadiazon Herbicide in Natural waters by a Micellar-Enhanced Photochemically-Induced Fluorescence Method.

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Introduction

Pesticides are widely used in agriculture to improve productivity. Oxadiazon is a oxadiazolone herbicide water soluble which can remain in soil for several months following application, residues can migrate to crops and enter the food chain, which can lead in general to diseases such as cancer. In this work, the objective is to develop an analysis method based on micellar-enhanced photochemically induced fluorescence (PIF) for the determination of oxadiazon. Generally, the use of micellar media was found to significantly enhance the PIF signal of pesticide relative to an aqueous solution [1-2]. In this work the quantification methods were evaluated and compared in aqueous solution and with two surfactants *i.e.*: cetyl trimethyl ammonium chloride (CTAC) or tweed 20 (tw20).

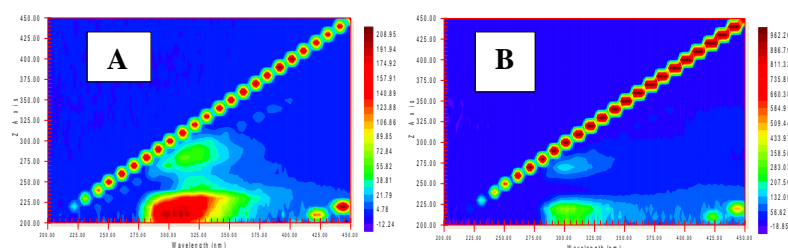
Materials and Methods

Not fluorescent compounds are irradiated by a power UV lamp, (300 w). All spectral of the so formed photoproducts were measured by a Cary Eclipse fluorescence spectrophotometer (Varian).

Results and Discussion

Oxadiazon exhibited no native fluorescence, while photoconversion under UV irradiation of the herbicide gives strongly fluorescent photoproducts in aqueous solution and in the presence of CTAC or tw20 at micellar concentrations (figure 1). Fluorescent photoproducts and emission spectra were obtained in optimal irradiation time. The calibration curves are linear over two order of magnitude and very low detection and quantification limits (in the ng mL⁻¹ range) were obtained in the presence of surfactants.

Figure 1 : 3D excitation and emission spectra of oxadiazon (10 µg/ml) after 5min and 7min of irradiation in respectively: A) CTAC (5.10⁻³ M) and B) TW20 (6.10⁻⁵ M)



Conclusion

We have demonstrated in this work that method is simple, sensitive, rapid and reproducible for the analysis of oxadiazon herbicide in water samples.

Bibliography

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