Determination of imidacloprid in water samples via photochemically induced fluorescence and second-order multivariate calibration

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© 2014 Elsevier B.V. All rights reserved. This paper presents a new method for the determination of imidacloprid in water samples; one of the most widely used neonicotinoid pesticides in the farming industry. The method is based on the measurement of excitation-emission spectra of photo-induced fluorescence (PIF-EEMs) associated with second-order multivariate calibration with a parallel factor analysis (PARAFAC) and unfolded partial least squares coupled to residual bilinearization (U-PLS/RBL). The second order advantage permitted the determination of imidacloprid in the presence of potential interferences, which also shows photo-induced fluorescence (other pesticides and/or unexpected compounds of the real samples). The photoreaction was performed in 100-?l disposable micropipettes. As a preliminary step, solid phase extraction on C18 (SPE-C18) was applied to concentrate the analyte and diminish the limit of detection. The LOD was approximately 1 ng mL-1, which is suitable for detecti