CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Determination of Isomethiozin in Soil by Differential-Pulse Polarography

Purpose

Isomethiozin (6-*tert*-butyl-4-isobutylideneamino-3-methylthio-1,2,4-triazin-5-one) and other triazine-based compounds (e.g., Ametryn, Prometryn) are used as herbicides. However, these compounds are toxic, and can enter the food cycle either directly or through contaminated water supplies.

Reference

Determination of Isomethiozin by Differential-Pulse Polarography, J.F.A. Valentin, R.B. Diez-Caballero and M.A.G. Altuna, Analyst 113 (1988) 629-632.

Method

The soil samples were dried in air and extracted three times with methylene chloride. The organic solvent was evaporated and the residue was extracted using a Britton-Robinson buffer (pH 1.9). The peak currents of isomethiozin in the samples were measured using differential pulse polarography, and the concentrations were calculated using calibration curves.

Results

The differential pulse polarogram of isomethiozin in the Britton-Robinson buffer showed two peaks (F1). The first (less negative) peak was attributed to the reduction of the azomethine group, and the second was attributed to the reduction of the keto group. The first peak was used for quantitative analysis due to its greater sensitivity.

The best results were obtained using the following conditions: pH = 1.9, scan rate = 7.5 mV/s and pulse amplitude = 40 mV. The current response for the first reduction was linear over the range of 1×10^{-6} M to 1×10^{-3} M, and the detection limit was 1×10^{-6} M (0.04 µg/g). No interference was observed from other organic compounds in the soil, or from other triazine herbicides.

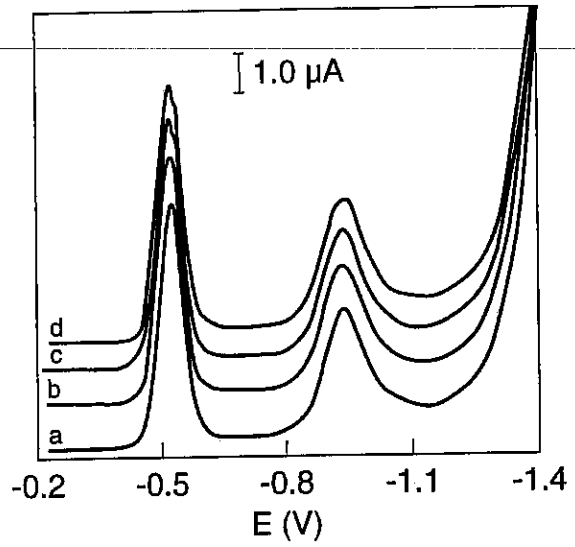

Figure 1. Differential pulse polarograms for isomethiozin at different scan rates. Scan rate = 3.75 (a), 7.5 (b), 15.0 (c) and 30.0 (d) mV/s. Figure adapted from Reference.