VOLTAMMETRIC DETERMINATION OF TWO PESTICIDES: METHOMYL AND DICHLORPROP METHYL ESTER

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Carbamate compounds were introduced as pesticides in early 1950s and are still used extensively in pest control due to their relatively short lifetime, effectiveness and broad spectrum of biological activity [1]. Chlorophenoxy acids are used as selective growth herbicides in agriculture [2]. Monitoring both carbamate and chlorophenoxy acid pesticides are of considerable importance due their widespread usage and toxicity to humans and living organisms.

Although adsorptive stripping voltammetry is an appropriate electroanalytical technique for trace determination of biologically active substances, electrochemical methods are not frequently used for the analysis of pesticides mixtures.

The aim of this work is determination of two commonly used pesticides belonging to carbamate and chlorophenoxy acid family, namely; methomyl and dichlorprop methyl ester. The adsorptive stripping square wave voltammetric experimental conditions were selected as: accumulation potential (-0.4V), amplitude 0.06V, frequency 60 Hz, accumulation time 90 s while using a hanging mercury drop electrode as working electrode. The supporting electrolyte was 100mM borate solution at pH 9.0 in presence of 20% (v/v) methyl alcohol. Both methomyl and dichlorprop methyl ester gave a single irreversible reduction peaks at -0.56. and -0.58V respectively versus Ag/AgCl. Calibration curves were plotted in concentration range of 0.15-0.30 mg/L and 0.29-0.56 mg/L for methomyl and dichlorprop methyl ester respectively.

References