

## Abstract

Tebuconazole is a triazole fungicide used in agriculture that can be present in the environment and have a negative effect on various organisms. Therefore, the electrochemical properties of tebuconazole and its complexation with Cu(II) ions on a boron doped diamond electrode were studied for its possible indirect detection in the presence of these ions. For the determination of Cu(II) ions, conditions in the concentration range  $0.1\text{-}10\text{ mol l}^{-1}$  were optimized by differential pulse voltammetry in a  $0.01\text{ mol l}^{-1}\text{ HNO}_3$  environment on anodically oxidized BDDE, the limit of quantitation was  $0.087\text{ }\mu\text{mol l}^{-1}$ . After optimization of the conditions, the indirect determination of tebuconazole was tested. The signal of free Cu(II) ions after the addition of tebuconazole was monitored. A decrease in this signal was observed and a linear calibration dependence could be measured for a decrease in the signal of  $10\text{ }\mu\text{mol l}^{-1}\text{ Cu(NO}_3)_2$  in the concentration range of  $2\text{-}10\text{ }\mu\text{mol l}^{-1}$  tebuconazole and for  $1\text{ }\mu\text{mol l}^{-1}\text{ Cu(NO}_3)_2$  in the concentration range of  $2\text{-}10\text{ }\mu\text{mol l}^{-1}$  and  $10\text{-}100\text{ }\mu\text{mol l}^{-1}$  tebuconazole. Complexation of tebuconazole with  $\text{Cu}^{2+}$  was shown to occur almost instantaneously. Tebuconazole itself gives an anodic peak at a potential of  $+1550\text{ mV}$  in aqueous medium of  $0.01\text{ mol l}^{-1}\text{ HNO}_3$ . Using differential pulse voltammetry, it was found that after polishing the electrode, the potential window shortens, tebuconazole cannot be trapped and the working electrode must be activated by cycling. Upon addition of Cu(II) ions to the tebuconazole solution, a decrease and shift of the tebuconazole signal to higher potentials was observed.

Key words: tebuconazole, complexation with Cu(II) ions, voltammetry, boron doped diamond electrode