VOLTAMMETRIC DETERMINATION OF BORON IN THE PRESENCE OF ALIZARIN RED S

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Boron has been determined indirectly by voltammetry due to it is electrochemically inactive. A mercury drop electrode has been used in most of the reported methods [1-8]. In this study, an alternative, mercury-free voltammetric method based on the complexation of boron with alizarin red S for the determination of boron using cobalt phthalocyanine modified carbon paste electrode (CoPcMCPE) was described. The parameters affecting peak current such as supporting electrolyte, pH and accumulation potential in the method using CoPcMCPE were determined as ammonium acetate-ammonia mixture, pH=7.5, 1x10⁻⁵ mol/L and -800 mV, respectively. The detection limits and quantitation limits of the method based on the standard deviation calculated from all points of the calibration equation for accumulation time of 0 and 30 s were calculated as 0.064 and 0.213 mg/L, and 9.9 and 32.9 μg/L, respectively. The method was applied to water samples. The accuracy and repeatability of the method were checked by applying the standard addition method for 30 s accumulation time and by comparing the results obtained from Azomethine H method. The results obtained from two methods were compared by using student’s t-test and no statistical difference, was found between the results for 95% confidence level. The recoveries were calculated in the range of 99-104% and the relative standard deviations were below 10%.

References