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
of

Chemistry

Kinetic Spectrophotometric Determination of Nanogram Levels of Manganese (II) by Azo Dye -- Potassium Periodate -- 1,10-Phenanthroline System

Konstantin L. MUTAFTCHIEV

Department of Chemistry and Biochemistry,  
Higher Medical Institute, 1 Kliment Ohridski Street, 5800,  
Pleven-BULGARIA

 [Keywords](#)  
 [Authors](#)



[chem@tubitak.gov.tr](mailto:chem@tubitak.gov.tr)

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**Abstract:** The catalytic effect of manganese (II) on the oxidation of 3 - Methyl - 6 - (2 - hydroxyethoxy) - 2 - [2 - methoxy - 4 - N (N,N - diethylamino) phenylazo] benzothiazolium methylsulphate (MHMDPBM), with potassium periodate in the presence of 1,10-phenanthroline in weakly acidic media was studied. The reaction was followed spectrophotometrically by measuring the decrease in the absorbance of the dye at 560 nm. Under the optimum conditions ( $4 \times 10^{-5}$  mol dm<sup>-3</sup> MHMDPBM,  $4 \times 10^{-4}$  mol dm<sup>-3</sup> potassium periodate,  $1 \times 10^{-4}$  mol dm<sup>-3</sup> 1,10-phenanthroline, 0.1 mol dm<sup>-3</sup> buffer -- pH 3.0, 70°C, 8 min), manganese (II) in the range 0.05-5 ng cm<sup>-3</sup> can be determined by the fixed-time method with a detection limit of 0.015 ng cm<sup>-3</sup>. The influence of foreign ions on the accuracy of the results was investigated. The developed method is extremely sensitive, selective, and simple. The method was applied successfully to the determination of total manganese in strawberries, raspberries and bilberries. The results showed good agreement with those obtained by atomic absorption spectrophotometry.

**Key Words:** manganese (II), kinetic determination, azo dye oxidation, berries

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