

Simultaneous determination of copper and iron by second derivative spectrophotometry using mixtures of ligands

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A highly sensitive and selective second derivative spectrophotometric method has been developed for the determination of copper and iron in mixtures. The method is based on the separation of the analytes by liquid-liquid extraction as picrate ion pairs. Iron-picrate, reacts in the organic phase of DCE with 5-phenyl-3-(4-phenyl-2-pyridinyl)-1,2,4-triazine (PPT). Similarly the copper-picrate reacts with 2,9-dimethyl-4,7-diphenyl-1,10-phenantroline (bathocuproine). The extracts were evaluated directly by derivative spectrophotometric measurement, using the zero-crossing approach for determination of copper and graphic method for iron. Iron and copper were thus determined in the ranges 8-120 ng ml⁻¹ and 8-125 ng ml⁻¹, respectively, in the presence of one another. The detection limits achieved (3 σ) were 2.9 ng ml⁻¹ of iron and 2.8 ng ml⁻¹ of copper. The relative standard deviations were in all instances less than 2.1%. The proposed method was applied to the determination of both analytes in