

# Simultaneous determination of iron and ruthenium as ternary complexes by extractive second derivative spectrophotometry

Toral, M. Inés

Richter, Pablo

Tapia, A. Eugenia

Hernández, Jimmy

A highly sensitive and selective second derivative spectrophotometric method has been developed for the determination of ruthenium and iron in mixtures. The method is based on the formation of the binary complexes of iron and ruthenium with 4,7-diphenyl-1,10-phenanthroline (bathophenanthroline) in the presence of ethyleneglycol. These complexes are formed at pH 4.0-6.0 upon heating at 90°C for 60 min. The ternary perchlorate complexes are then separated by liquid-liquid extraction. The extracts were evaluated directly by derivative spectrophotometric measurement, using the zero-crossing approach for determination of both analytes. Ruthenium and iron were thus determined in the ranges 9.6-450 and 16.3-280 ng/ml, respectively, in the presence of one another. The detection limits achieved (3 $\sigma$ ) were found to be 2.9 ng/ml of ruthenium and 4.9 ng/ml of iron. The relative standard deviations were in all instances less than 1.5%. The proposed method was applied to the determination of both ana