

Abstract

This bachelor thesis describes the optimization of condition for the analysis of potassium tetrachloroaurate by capillary zone electrophoresis with spectrophotometric detection.

The theoretical part at first introduces the principle of capillary electrophoresis. The following are basic information about gold and its tetrachloroaurate compound.

The experimental part at first describes the procedure of optimization the composition of the basic electrolyte and problems with the instability of the base line. As the most suitable conditions for the analysis of tetrachloroaurate, have been chosen the subsequent experimental conditions: fused silica capillary with a total length of 80 cm, effective length 71.6 cm and inner diameter 50 μm ; applied separation voltage -20 kV; applied pressure during analysis 20 mbar; injection with 20 mbar for 20 s; background electrolyte containing 0.01 mol dm^{-3} HCl and 0.04 mol dm^{-3} NaCl; detection wavelength at 230 nm. Subsequently, the repeatability of the measurement, and the stability of the tetrachloroaurate stock solution were evaluated. Also the calibration dependence were measured and the limit of detection and the limit of quantification were determined for the optimized experimental conditions. The value of LOD was $7.49 \cdot 10^{-6} \text{ mol dm}^{-3}$ and the value of LOQ was $2.49 \cdot 10^{-5} \text{ mol dm}^{-3}$.

Keywords:

Capillary zone electrophoresis, potassium tetrachloroaurate