

Abstract

This article describes a new method for the simultaneous determination of trace rare earth elements (REEs) and non rare earth elements (NREEs) in high purity terbium oxide by ICP-AES after HPLC separation using P507 resin. The chromatographic separation of the analytes from the matrix using dilute nitric acid as mobile phase was studied. The experimental results showed that a favorable separation of trace metals (Cu and Gd) from the matrix (Tb) can easily be achieved by elution with dilute nitric acid within 25 min. The proposed method was applied to the determination of trace metals (Ca, Cu, Mg, Mn, Ni, Si, La, Ce, Pr, Nd, Sm, Eu and Gd) in high purity terbium oxide. The detection limits (DLs) for the analytes ranged from 0.4–4.0 $\mu\text{g}\cdot\text{g}^{-1}$, and the recoveries are from 78%–105%.