

Abstract:

N-Phenylcinnarnohydroxamic acid (PCHA) reacts with iron(III) and vanadium(V) in the presence of thiocyanate to form water-insoluble orange and green complexes, respectively. The iron(III)-PCHA and vanadium(V)-PCHA-thiocyanate complexes can be quantitatively extracted into toluene and other common organic solvents at pH 1.5–2.0. The absorption spectra and composition of both complexes are described. The effects of foreign ions and of experimental variables on the extraction and determination of the two metal ions are studied. A simple, selective method is described for the simultaneous determination of iron(III) and vanadium(V) by extraction-spectrophotometry; absorbances are measured at 440 and 580 nm. Mixtures can be determined over the range 10^{-4} – 10^{-5} M in each metal. The method was applied successfully to the analysis of standard steels for iron and vanadium.