

Abstract

In this work a procedure for the concentration of boric acid from water on a catecholic modified silica gel was developed. The target was to get an eluent which concentration of boric acid could be analyzed with the flame atomic emission spectrometry. The latter has a detection limit for boron of 1 mg/L. First the silica gel was cleaned and dried. Then a spacer, in this case 3-aminopropyl-triethoxysilane, was subsequently fixed on the silica's surface. For the catecholic compound 2,3-dihydroxybenzoic acid was used. The catecholic OH-groups were protected as trimethylsilylethers. The acid function was transformed to an acyl chloride. This function could be coupled with the amine of the spacer. The protecting groups were eliminated by treating the modified silica gel with water. The received phases were analyzed because of their ability to concentrate boric acid in solutions with different pH values from 1 up to 9. Corresponding works were made for the elution of boric acid. The best concentration of boric acid was found at a pH value of 8. For this reason a buffer must be used for the concentration step. The buffer consisted of a solution of di-ammoniahydrogen-phosphate, di-ammonia-EDTA and ammonia. The elution was performed with 1 mol/L hydrochloric acid. The eluates were analyzed with the flame atomic emission spectrometry. The detection limit for this procedure was determined to be 0,03 mg/L B. In comparison with the DIN procedure for the determination of boric acid in water with Azomethin-H 15 specimen of various rivers and lakes of the immediate environs were examined with both procedures.