

Nisa Nuangchamnong 2008: Determination of Cadmium(II) and Aluminium(III) as 8-Hydroxyquinoline-5-sulphonate Complexes by Synchronous-scanning Fluorescence Spectrometry. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Miss Pornpun Pornsinlapatip, Ph.D. 113 pages.

A synchronous-scanning fluorescence (SSF) method was first developed for simultaneous determination of cadmium(II) and aluminium(III) based upon the formation of fluorescent chelates with 8-hydroxyquinoline-5-sulphonic acid (HQS). Under the optimised conditions Cd(II)-HQS and Al(III)-HQS emitted fluorescence at  $\lambda_{em}$  of 519 nm and 497 nm, respectively. Strong interference between the two metals was observed. SSF and derivative SSF methods were applied in an attempt to resolve the interference without prior chemical separation.

Instrumental parameters were optimised. Wavelength intervals of 120 nm and 115 nm were used in SSF of Cd(II)-HQS and Al(III)-HQS, respectively. The resolution of spectral peaks was improved but inadequate for use in binary mixture. Zero-crossing wavelengths in D1SSF and D2SSF spectra of Cd(II)-HQS were used for signal measurement of Al(III)-HQS, and vice versa. The D1SSF zero-crossing wavelengths of Cd(II) and Al(III) were 302 nm and 438 nm, and those of D2SSF were 400 nm and 443 nm, respectively. The resolution and the independence of signals were improved considerably compared to those obtained from conventional fluorimetry (CF). The determination of Cd(II) and Al(III) were accomplished by means of external calibration method. The calibration graphs of D1SSF and D2SSF were linear over 0-1000  $\mu\text{g l}^{-1}$  of metals. Good correlation coefficient was obtained: 0.9916 and 0.9628 for Cd(II); and 0.8909 and 0.9560 for Al(III), respectively. The analysis of synthetic samples yielded quite satisfactory results. The methods were simple, rapid, and cost-effective.

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