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ACCEPTED MANUSCRIPT

**Use of sequential injection analysis with lab-at-valve and an optical probe for simultaneous spectrophotometric determination of ascorbic acid and cysteine by mean centering of ratio kinetic profiles**

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### **Abstract**

Two new, simple, relatively fast and robust methods for the simultaneous kinetic determination of binary mixtures of ascorbic acid (Asc) and cysteine (Cys) were developed using the mean centering of ratio kinetic profiles method. The methods are based on the difference in the reaction rates of Asc and Cys with 18-molybdodiphosphate at pH 5.1. An optical probe as well as the sequential injection analysis lab-at-valve (SI-LAV) method were used to carry out simultaneous kinetic analysis. The benefits of the mean centering of ratio kinetic profiles method were shown in comparison with other spectrophotometric kinetic methods. Asc and Cys can be determined in the concentration ranges 20-200 and 8-90  $\mu\text{mol L}^{-1}$  with the batch spectrophotometric method and 10-200 and 4-40  $\mu\text{mol L}^{-1}$  with the SI-LAV method, respectively. The method was successfully used to determine Asc and Cys in dietary supplements.

**Keywords:** Sequential injection lab-at-valve; Optical probe; Mean centering; Ratio kinetic profiles; Ascorbic acid; Cysteine

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