

Thesis Title Development and Construction of Flow Injection Analysis System for the Determination of Cadmium Copper Iron and Lead Using an Atomic Absorption Spectrophotometer as Detector

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### ABSTRACT

The main objectives of this study were (1) to develop and construct a flow injection analysis system by using an atomic absorption spectrophotometer as a detector (FIA-AAS) to determine cadmium, copper, iron and lead in standard solutions (2) to evaluate its performance and (3) to investigate a detection limit and precision for determining cadmium, copper, iron and lead by FIA-AAS and to compare the results with those obtained by conventional atomic absorption spectrophotometry. Under suitable conditions, the constructed equipment could be used to determine cadmium, copper, iron and lead at a rate of 240 determinations per hour and the read-out was available within 15 seconds after injecting standard solution. The

detection limits for cadmium, copper, iron and lead (at 217.0 nm and 283.3 nm) were 0.02, 0.01, 0.02, 0.02 and 0.05 ppm, respectively. The relative standard deviations were in the range of 0.9–5.0 %. This FIA-AAS method gave detection limits which were over 1.0, 10.0, 7.5, 1.2 and 5.0 times better than the conventional AAS and the precisions of the technique were better than 1.4, 9.6, 35.8 and 15.7 times at the 0.05 ppm level for aqueous standards of cadmium, copper, iron, and lead (both at 217.0 and 283.3 nm), respectively.



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