

ABSTRACT

ANALYSIS OF PARAQUAT BY
FLOW INJECTION ANALYSIS

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A flow injection analysis (FIA) procedure has been developed for paraquat in whole blood, plasma, urine, and selected local vegetables. The overall analytical procedure involves acid extraction with ultrasonic agitation, cation exchange purification of extracts, and determination of paraquat by FIA using alkaline sodium dithionite reagent, and a saturated KCl carrier stream. The detection limits of the method are 0.04 $\mu\text{g}/\text{mL}$ for whole blood, 0.04 $\mu\text{g}/\text{ml}$ for plasma, 0.02 ug/mL for urine, 0.02 $\mu\text{g}/\text{mL}$ for lettuce and 0.01 $\mu\text{g}/\text{mL}$ for patchoi, cabbage, water cress and cauliflower.

Although sample extraction and purification require 3-4 hours per sample, the FIA determination is capable of 30 analyses per hour.

A kit for rapid semi-quantitative estimation of paraquat in urine has also been developed, using permanent dyes to generate a visual calibration range for paraquat. This kit allows reasonably accurate values of paraquat in urine to be determined within 60 seconds and can be effectively used together with prognosis charts to estimate the severity of poisoning.

A collaborative study with the San Fernando General Hospital to monitor the blood and urine of paraquat-poisoned patients on admission and following treatments was undertaken. Poor sampling practices and documentation resulted in only limited data, which nevertheless agreed with published data for prognosis and plasma paraquat levels with time.

The brief survey of vegetables for residual paraquat revealed no detectable levels in lettuce or cabbage.