



Modified Popoff's Reaction for Indirect Spectrophotometric Determination of Cypermethrin

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ABSTRACT

A new and highly sensitive spectrophotometric method is developed for the determination of parts per million levels of widely used Cypermethrin insecticide. The method is based on hydrolysis of Cypermethrin (Popoff's Reaction), which further react with potassium iodide-iodate solution under acidic conditions to liberate iodine and the liberated iodine selectively oxidizes leucomalachite green to malachite green dye. The absorption maxima of the dye formed is measured at 610 nm in acidic medium. Beer's law is obeyed over the concentration range of 2.0 to 16 μg in a final solution volume of 25 ml (0.12-0.68 ppm). The molar absorptivity and Sandell's sensitivity were found to be $3.3 \times 10^5 \text{ L mole}^{-1} \text{ cm}^{-1}$ and $0.054 \mu\text{g cm}^{-2}$ respectively. The standard deviation and relative standard deviation were found to be ± 0.001 and 0.22% respectively. The method is simple sensitive and free from interferences of other pesticides and diverse ions. Other pyrethroid insecticides do not interfere in the proposed method. The method has been satisfactorily applied to the determination of Cypermethrin in various environmental and biological samples. Statistical treatment of the experimental results indicates that the method is precise and accurate.

Keywords: Popoff's reaction, leucomalachite green, pyrethroid insecticide.
