

TLC-Spectrophometric Separation and Trace Determination of Monocrotophos and Dichlorvos in Enviromental and Biological Samples

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Organophosphorus insecticides, monocrotophos and dichlorvos are increasingly being used in agriculture to control insects on a wide range of crops. Their ready access has resulted in misuse in many instances of homicidal and suicidal poisoning cases. This paper describes about a chromogenic spray reagent for the detection/determination of monocrotophos and dichlorvos in environmental and biological samples by TLC and spectrophotometric method. Monocrotophos and dichlorvos on alkaline hydrolysis yield N-methyl acetoacetamide and dichloroacetaldehyde respectively, which in turn react with diazotized p-amino acetophenone to give red-violet and red coloured compounds. Other organophosphorus insecticides do not give this reaction. Moreover, organochlorine and synthetic pyrethroid insecticides and constituents of viscera (amino acids, peptides, proteins etc), which are generally coextracted with the insecticides, do not interfere. However, phenolic compounds and hydrolysed product of carbamate insecticides may interfere and differentiate from monocrotophos and dichlorvos by R_f values. The lower limit of detection is 0.2 mg for monocrotophos and 0.1 mg for dichlorvos. The absorption maxima of the reddish-violet and red colour formed by monocrotophos and dichlorvos, are measured at 560 nm and 540 nm respectively. Beer's Law is obeyed over the concentration range of 1.2 to 6.8 mg and 6.2 to 35 mg in the final solution volume of 25 mL. The molar absorptivity and Sandell's sensitivity of monocrotophos and dichlorvos were found to be $7.1 \times 10^5 (+100) \text{ l mole}^{-1} \text{ cm}^{-1}$ and 0.008 mg cm^{-2} , $1.2 \times 10^5 \text{ l mole}^{-1} \text{ cm}^{-1}$ and 0.003 mg cm^{-2} respectively. The standard deviation and relative standard deviation were found be ± 0.005 and $2.05\% \pm 0.007$ and 2.02% respectively. The developed method has been successfully applied to the detection and determination of monocrotophos and dichlorvos in environmental and biological samples.

Key words : *TLC, spectrophotometry, monocrotophos, dichlorvos, p-aminoacetophenone, environmental and biological samples*