

DETERMINATION OF DELTAMETHRIN IN EDIBLE OIL

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294

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SCOPE

This test method prescribes the requirements for the determination of deltamethrin residue in oil.

DEFINITION

Deltamethrin is the common name for (S)- α -cyano-3-phenoxybenzyl(1R)-cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropane carboxylate with the structure as in *Figure 1*.

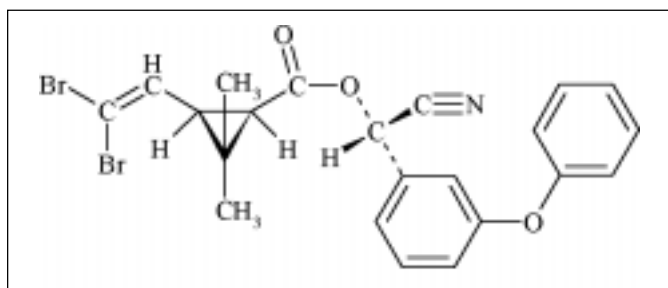


Figure 1. Deltamethrin chemical structure.

It is a colourless crystalline solid with a melting point of 98°C-100°C. The vapour pressure is 0.002 mPa at 25°C and it is almost insoluble in water with a solubility of 0.002 g litre⁻¹ at 20°C. Solubility in other solvents: acetone 500 g litre⁻¹,

benzene 450 g litre⁻¹, cyclohexanone 750 g litre⁻¹, dioxane 900 g litre⁻¹ all at room temperature while solubility in ethanol at 20°C is 900 g litre⁻¹. It is a lypophilic compound and has low volatility.



Figure 2. Gel permeation chromatography set-up.

PRINCIPLE

The pesticide residues are extracted from the oil matrix and the extracted sample is separated from the co-extractives using gel permeation chromatography (*Figure 2*) with Bio-Beads SX-3 as the solid phase. The fraction containing the analyte is collected, solvent evaporated and injected into a gas chromatograph fitted with a micro-electron capture detector (*Figure 3*).



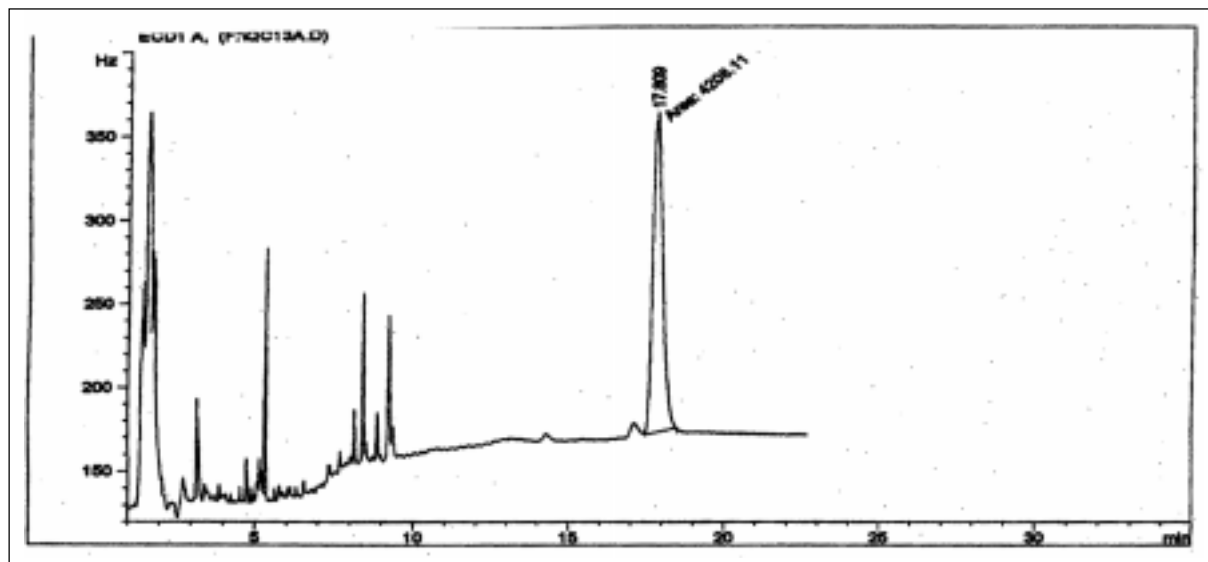


Figure 3. Chromatogram of standard deltamethrin.

RECOVERY

Recoveries of deltamethrin from oil matrix at the range of 0.02-1.0 $\mu\text{g g}^{-1}$ were 74.5%-94.7%.

Coefficient of variations were <15% for high concentrations and within 10%-25% for low concentrations.

Limit of detection was 0.023 mg kg^{-1} .

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