Title : Optimization of GC-MS Conditions and Solvent Selection for the Analysis of Carbamate and Organophosphate Pesticides in Food

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ABSTRACT

This study aimed to develop a suitable analytical method for pesticide detection using Gas Chromatography-Mass Spectrometry (GC-MS). The focus was on optimizing conditions for the analysis of 10 pesticides from the carbamate and organophosphate groups. The results showed that Condition B was the most appropriate, as it allowed the detection of 9 out of 10 pesticides, including carbaryl, carbosulfan, fenobucarb, methomyl, propoxur, diazinon, dichlorvos, ethion, and malathion, except for pirimiphos-methyl, which could not be analyzed due to its boiling point being higher than the column temperature. Additionally, Condition B also reduced the analysis time effectively. Regarding the extraction of pesticides from rice samples using solid-phase extraction, the choice of solvent was found to affect extraction efficiency. Acetone was the most suitable solvent for extracting methomyl, while ethyl acetate was the most effective for extracting fenobucarb. These findings highlight the importance of selecting the appropriate conditions and solvents for pesticide analysis. The developed method can be applied in the detection of pesticide residues in forensic samples to enhance the reliability and accuracy of the justice process.

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