Using DIP-MS for direct soil analysis of organophosphorus pesticides. (S02-sarkar162959-Poster)

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Abstract:

An analytical instrument for directly analyzing organophosphorus pesticides (OPP) in solid matrices was built with a multi-gram capacity Direct Insertion Probe (DIP) interfaced with a quadrupole Mass Spectrometer (MS). The DIP-MS system was used to analyze acephate, chlorpyrifos, and diazinon in a 'clean' sand matrix, namely Ottawa Sand; diazinon was also analyzed in a Florida spodosol, namely Immokalee Sand. Instrument detection limit studies indicate that the DIP-MS is capable of detecting 5 microgram acephate in the absence of interfering matrix. Method detection limits for chlorpyrifos and diazinon were calculated at 92 and 2.5 micrograms, respectively. DIP-MS analysis of diazinon in the Immokalee Sand showed up to 50% reduction in instrument response compared to the relatively pure Ottawa Sand, attributable to the 'dilution-effect' of co-desorbing soil organic matter. Results of performance evaluation in Immokalee Sand indicate the potential of the DIP-MS technique to directly analyze OPP and other thermally extractable chemicals in soils and other solid matrices without the need for solvent extraction, sample pre-treatment, or confirmation by other analytical methods.

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