K9 The Analysis of LSD in Urine by Quadrupole GC/MS

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The goals of this research project are to determine a fast, sensitive method for the analysis of LSD in urine

A method has been developed by which LSD in urine is analyzed by the ThermoFinnigan Trace DSQ dual stage quadrupole GC/MS. The first quadrupole is a small, bent set of rods that greatly reduces interference from neutral noise, one of the main causes of high background and hence poor sensitivity. The main analytical rods follow the bent quadrupole. The detection and analysis of LSD can be particularly difficult do to the low detection limits required for this drug. One percent or less of the parent LSD is excreted in urine and LSD dosages are in the low microgram level, therefore a method of analysis needs to reach the low pg/ml levels of detection. This is accomplished using a strong derivatizing agent, N-Methyl-N-(trimethylsilyl)trifluoroacetamide (MSTFA), and a single ion monitoring experiment on the DSQ mass spectrometer. A calibration curve from 10 pg/mL to 500 pg/mL was run on the Trace DSQ system. A series of spiked samples in urine matrix were then extracted with solid phase extraction tubes to verify the application of the method. The collected drug was then derivatized with MSTFA and injected into the Trace DSQ system. Two microliters were injected into a split/splitless injector with a 5mm internal diameter. The volume of this liner allows for a greater injection volume without any back flash and contamination of the system. Due to the low levels required for this analysis, a full scan analysis cannot be used. Single ion monitoring allows the quadrupole to analyze one ion at a time and therefore increase the sensitivity of the analysis. The DSQ mass spectrometer was programmed for a multi ion SIM experiment. Three ions were selected, one ion for quantitation and the other two for confirmation. This paper shows that this method is able to reach the low levels required for the routine analysis of LSD in urine.

LSD, GC/MS, SIM

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