



A1 Validation of a Qualitative TLC Analysis of Seized Ecstasy Tablets Using Easy Ambient Sonic-Spray Ionization Mass Spectrometry (EASI-MS)

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After attending this presentation, attendees will be able to use TLC as an analytical tool in forensic ecstasy analysis. Attendees will also discover the application of EASI-MS technique in forensic analysis.

This presentation will impact the forensic science community by the insertion of a new application of mass spectrometry in forensic sciences. This presentation will show a rapid and conclusive technique to be used in forensic chemistry.

Ecstasy is the popular name of an illicit drug sold as tablets constituted by the compound 3,4-methylenedioxymethamphetamine (MDMA). Thin Layer Chromatography (TLC) is the most widely used analytical technique in Brazil as it is a low-cost analysis. The process of validation of drug TLC analysis is crucial to generate trustworthy, credible, and quality results in forensic chemistry.

Among the elution systems studied, $\text{CH}_3\text{OH} / \text{NH}_4\text{OH}$ (98:2 ml); and $\text{CH}_3\text{CH}(\text{CH}_3)\text{OH} / \text{CH}_3\text{OH}$ (95:5 ml) showed the best resolution results by TLC analysis. All mobile phases developed show similar R_f values between main active substance present in ecstasy tablets and metamphetamine (MDMA), a good resolution of MDMA in relation to other standards studied (MDA, MDEA, amphetamine, ketamine, and caffeine) were obtained from the systems described above.

TLC results were confirmed using a new technique of ambient mass spectrometry, easy ambient sonic spray ionization (EASI-MS). EASI was developed by Eberlin *et al.* and has already been successfully applied to different analytes in different matrixes such as ecstasy and m-CPP tablets, perfumes, surfactants, and biodiesel. The combination of TLC and EASI-MS techniques provides a valuable tool in forensic analysis, generating conclusive results in reduced time.

Several standards in this study (MDMA, MDA, MDME, caffeine, ketamine, methamphetamine, and amphetamine), and ecstasy tablets (street samples) are analyzed with TLC plates. A TLC/EASI-MS system for a rapid analysis of ecstasy tablets was developed to validate TLC analysis using EASI-MS technique, identifying compounds present in the eluted spots with great sensitivity.

The TLC/EASI-MS system can be used as a valuable tool in forensic analysis, confirming the presence of MDMA in the sample. Among 25 tablets analyzed, three show negative results for MDMA, where the presence of lidocaine and caffeine were identified. TLC/EASI-MS was not found to be appropriate to confirm caffeine due to its high plate affinity and typically low concentration in the ecstasy tablets. GC-MS analysis is a better analysis technique for the confirmation of caffeine.

Ecstasy-Like Tablets, MDMA,

TLC/EASI-MS System