B35 Comparison of the Restek Rtx®-5, Rxi®-1ms, and Rxi®-1HT Gas Chromatography (GC) Columns for the Qualitative Analysis of Synthetic Cannabinoids

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After attending this presentation, attendees will better understand the difficulties of synthetic cannabinoid analysis in a high-throughput setting and gain insight as to what GC columns could be put to use in the laboratory to improve the efficiency of synthetic cannabinoid analysis.

This presentation will impact the forensic science community by providing results from a comparison of synthetic cannabinoid qualitative analysis using the Restek Rtx®-5, Rxi®-1ms, and Rxi®-1HT GC columns. This research could impact law enforcement efforts by serving as a resource for all forensic drug laboratories searching for ways to make their analysis of synthetic cannabinoids more efficient.

As popularity of synthetic cannabinoids and the prevalence of their harmful side effects grow, so does the need to control such substances. For high-throughput laboratories such as the West Virginia State Police (WVSP) Drug Identification Laboratory, the high molecular weight and low volatility of synthetic cannabinoids poses a problem for analysis as not all synthetic cannabinoids elute within the parameters of their standard Gas Chromatography/Mass Spectrometry (GC/MS) method. This study compares the Restek Rxi®-1ms and Rxi®-1HT GC columns to the Restek Rtx®-5 GC column (standard in the WVSP Drug Laboratory) to determine if either column could improve the efficiency of synthetic cannabinoid analysis using the standard GC/MS method.

A total of 53 synthetic cannabinoid standards were analyzed and the results indicated a dramatic decrease in retention time (average of 2.106 minutes) when using the Restek Rxi®-1HT GC column for analysis and a slight decrease in retention time (average of 0.488 minutes) when using the Restek Rxi®-1ms GC column for analysis. Data from both the Restek Rxi®-1ms and Rxi®-1HT columns were determined to be statistically significantly different from data obtained using the Restek Rtx®-5 column, based on paired *t*-tests with 95% confidence intervals. Both columns demonstrated adequate reproducibility of retention time for the qualitative analysis purposes of the WVSP Drug Identification Laboratory. In conclusion, the Restek Rxi®-1HT and Rxi®-1ms columns proved to be a promising possibility for the qualitative analysis of synthetic cannabinoids in high-throughput laboratories.

Synthetic Cannabinoid, Gas Chromatography, Qualitative

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