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Characterization of delta-8 THC Distillates using High Resolution Mass Spectrometry

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Abstract: The use of $\Delta 8$ -THC in consumer products has caused safety concerns in the US. Though $\Delta 9$ -THC is the main intoxicating component in the cannabis plant, its isomer, $\Delta 8$ -THC, naturally occurs in the cannabis plant at low levels. The $\Delta 8$ -THC used in consumer products is typically produced from hemp-derived CBD which many consider legal under the 2018 US Farm Bill. Regulations governing the use of synthetic components derived from hemp are not clearly addressed which has created a growing market for $\Delta 8$ -THC production and use. The conversion of CBD to $\Delta 8$ -THC requires harsh conditions leading to multiple reaction byproducts which need to be characterized to enhance understanding of the chemical components produced. In this study, $\Delta 8$ -THC distillates were analyzed by UHPLC with both PDA detection and quadrupole time-of-flight (QToF) mass spectrometry using data independent analysis. Multiple unknowns were detected in distillate samples with fragments that indicate structural similarity to $\Delta 9$ -THC plus other chlorinated analogues.