## B11 Improvment and Comparison of Sample Collecting Methods of SPME, Charcoal and Tenax TA Adsorption for Accelerants in Fire Debris

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This presentation will provide the attendee with improved collection techniques for accelerants with SPME, charcoal, and Tenax TA adsorption and teach proper sample selection and preparation methods depending on the types of samples.

Collection and detection of ignitable liquids from fire debris are important in determining the cause of a fire. Since 1960, various kinds of sample preparation methods, such as distillation, solvent extraction, static and dynamic headspace enrichment, solid phase micro extraction (SPME), charcoal, and Tenax TA adsorption have been introduced. Of the above pretreatment methods, SPME, charcoal, and Tenax TA adsorption procedures could be thought as convenient, sensitive, and time saving methods for collecting accelerants from fire samples. The authors studied these methods to improve the sensitivity and collection efficiency and achieve much higher decontaminate remnants from a collecting tool using a vacuum and polyethylene bag. By reducing pressure of the heated oven over pretreatment, the recovery efficiency by methods of SPME, charcoal and Tenax TA, increased and sample preparation time was shortened compared to that of static heated methods. Those methods were compared for detection limit, time savings, convenience for treating the samples to collect ignitable liquids, and so on. The detection limit of ngs for kerosene in all extraction methods was very good. The SPME method was especially convenient and sensitive but should be adsorbed every time to check extracted samples with GC or GC/MS. Extraction of accelerants by the charcoal adsorption method using polyethylene bags and heated vacuum with reduced pressure was sensitive and time saving when putting many bags in an oven at one time. Compared to the SPME technique, the extracted samples by charcoal method can be checked many times in one pretreatment. This method could be much more time saving than SPMEs. The collection of flammables by Tenax TA adsorbent was also a sensitive and convenient method and especially good for large samples. However, should too much accelerant be absorbed in the Tenax TA adsorbent, the overload for the analysis column may lead to bad separation of components. Before pretreatment with Tenax TA adsorbent, the headspace method should be carried out to check the amount of ignitable liquids contained in a sample. As mentioned above, there are merits and deficiencies in every pretreatment method, therefore, forensic chemists should select the proper method according to the types of samples. Generally, SPME, charcoal adsorption, and Tenax TA adsorption procedures showed excellent results to collect ignitable liquids from fire samples.

**Collecting Ignitables, Accelerants, Fire Debris**

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