

3rd International Conference on Forensic Research and Technology

October 06-08, 2014 Hilton San Antonio Airport, USA

The use of localised thermal desorption for extraction of volatile hydrocarbons from within a fire scene: A multi-study analysis

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Fire scene investigation can be aided by detecting the presence of chemical compounds native to commonly-used accelerants, such as petroleum. An accepted method for detecting these compounds involves the use of thermal desorption coupled with headspace sampling for extraction, followed by chemical analysis using Gas Chromatography Mass-Spectrometry (GC-MS). This procedure traditionally requires the transport of debris to a laboratory, which presents a problem when attempting to extract accelerant residue from fixed surfaces within a scene. Over the past three years multiple studies have been conducted at the Canberra Institute of Technology using a custom-made Passive Headspace Residue Extraction Device (PHRED) to create an isolated headspace within a target region of the fire scene, without causing heat damage to the scene itself. Studies have involved sampling the headspace via activated charcoal and Solid Phase Microextraction and subsequent analysis via GC-MS. The results of these various studies have found this technique to be a viable, non-destructive approach for chemical compound extraction and collection.

Biography

Tom Smale completed his Bachelor of Forensic Science in 2011 from the Canberra Institute of Technology and his Bachelor of Psychology with Honours in 2005 from the Australian National University. He has previously worked with the Australian Federal Police Firearms ID & Armoury Team in a voluntary capacity and currently lectures at the Canberra Institute of Technology in Crime Scene Investigation, Communication in Forensic Science, Comparative Analysis and Court Procedures and Protocol. He has recently published his first journal article in the *Australian Journal of Forensic Science*.

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