

Matrix Challenging Analytical Science



BAT Research Labs on 22nd & 23rd May 2013

“The New Auditorium”, British American Tobacco, R&D Centre,
Regents Park Road, Southampton, SO15 8TL, UK



The Chromatographic Society is an internationally connected organisation and UK registered charity devoted to the promotion and dissemination of knowledge on all aspects of chromatography and related separation techniques.

The Chromatographic Society's AGM will feature as an integral part of this symposium.

The complex challenges that face today's analytical chemists will form the basis of this symposium.

A selection of some of the most challenging, diverse and difficult to analyse matrices and analytes has been selected for discussion. Successful methodological sample preparation approaches and associated state of the art instrumentation will be described by leading experts in their respective fields.

If you are a laboratory, industrial or forensic analyst faced with problems of selectivity, specificity and sensitivity, especially in matrices that are difficult to prepare and process, this is a must attend symposium for you.

If you are a manufacturer of analytical instrumentation or a contract analytical laboratory engaged in measurements and determinations in the forensic and environmental fields you will benefit from attendance.

A Two Day Symposium Focussing On Today's Challenges To Separation Science Posed By Complex Matrices.

Chromatographic and mass spectrometric analysis in cadaveric tissues, vegetable matter, smoke aerosols, particulates and products of combustion will be explored by specialists from a variety of industries.

An exhibition of analytical instrumentation by leading manufacturers will form an important element of the symposium.

Our Special Guest Speakers will include:

Professor Dr Ralf Zimmermann, Head of the 'Joint Mass Spectrometry Centre' – JMSC @ University of Rostock and Helmholtz



Zentrum München:

'On-line Monitoring of Complex Mixtures by Photoionisation Mass Spectrometry'

Professor Jean-François Focant, University of Liege:

'Chasing away the smell of death: GCxGC-TOFMS characterization of cadaveric VOCs'

Soon after death, the decay process of mammalian soft tissues begins and leads to the release of hundreds of cadaveric VOCs into the surrounding environment. The study of post-mortem decomposition products is an emerging field of study in forensic science.

The complex processes of decomposition produce a variety of compounds as soft tissues and their component parts are broken down. These decomposition



products include the VOCs responsible for the odour of decomposition. Human remains detection (HRD) dogs utilise this odour signature to locate human remains during police investigations and recovery missions in the event of a mass disaster. Currently, it is unknown which compounds or combinations of compounds are recognised by the HRD canines. Furthermore a comprehensive decomposition VOC profile remains elusive.

This presentation will illustrate recent advances in the characterisation of human analogue decomposition VOCs using thermal desorption (TD) coupled to GCxGC, TOFMS. Decomposition headspace analyses of pig carcasses, grave soils, and HRD canine training solutions have been investigated.

Several hundreds of post-mortem compounds have thus been identified.

It is believed these results will help to improve the design of the anatomo-chemistry and geo-forensic applications that could be of great value in forensic investigations.

Dr Jasper van Heemst, BAT R&D labs Southampton:

'Application of GC/HRTof for the identification and comparison of tobacco smoke constituents'

Most extracts of plant-derived materials present analytical chemists with matrices that are particularly challenging to analyse. These extracts contain numerous compound classes with large variations in solubility, reactivity, stability and other chemical and physical properties. Furthermore, the abundances of compounds in these extracts vary widely from high concentrations to trace levels.

Tobacco extracts and smoke condensates' chemical composition increases in complexity as a result of curing, combustion and thermal degradation processes. Tobacco smoke is a very complex aerosol which contains over 5600 identified compounds and suggestions that the total number may approach 100,000.

Part of this research is focussed on understanding the processes driving the formation of smoke constituents. In order to understand these processes better, there is a need to characterise fully the compounds present in tobacco and smoke. This requires a non-targeted screening approach coupled with the capability to identify subtle differences in chemical profiles between samples. GC x GC - ToF approaches have been explored for the separation and identification of components in tobacco smoke and currently methods are being developed in which gas chromatography is coupled to high-resolution time-of-flight mass spectrometry to enable comparison of chromatographic data from different tobacco smoke samples.

'Estimation of human smoke exposure by chromatographic analysis of spent cigarette filters'

Dr Peter Clayton, BAT R&D labs, Southampton:

'Estimation of human smoke exposure by chromatographic analysis of spent cigarette filter extracts'

The presentation will explain the analytical measurements required to conduct the methodology and will detail some of the results published by BAT GR&D. A particular emphasis of the presentation will be the estimation of the mouth-level exposure to tobacco-specific nitrosamines a number of which are categorised as priority toxicants in smoke.

The Filter Analysis Method allows the estimation of 'tar' and nicotine yields obtained by individual smokers smoking their own cigarette in their everyday environment. It is a measure of the mouth-level exposure, the maximal exposure of tar, nicotine and other selected toxicants obtained by the smoker rather than the dose to a specified tissue.

The technique is based on the analysis of spent (smoked) cigarette filter tips which are extracted and related to smoking machine derived spent filter tips where, additionally, the mainstream smoke yields are known. The advantages of the approach include that no direct assumptions are made regarding the smoking behaviour of consumers; individual human smoke yields are estimated based on the amounts of constituents (namely nicotine, solanesol, UV absorbing species) deposited on a portion of the filter tip. The technique is non-invasive, allows for the characterisation of the natural smoking behaviour of large numbers of study participants.

Dr Greg Johnson, Thermo Fisher Scientific:

'Developments in GCMS/MS to achieve increased efficiency and accuracy in the analysis of complex matrices'

'Chasing away the smell of death'

GCxGC-TOFMS characterisation of cadaveric VOCs

'Application of GC/HRTof for the identification and comparison of tobacco smoke constituents'

The registration fees include meals and refreshments supplied at the Symposium.

In order to encourage social networking between delegates, presenters and exhibitors an evening social event at the Sea City Museum, Southampton and a local inner-city pub quite close to the Museum will be organised.

BAT will offer a lab tour and open their specialist historical exhibition attraction to all attendees during the symposium.

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Dr Chris Bevan at: chris.anne.bevan@gmail.com

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DELEGATE ADMISSION PRICES:

CHROMATOGRAPHIC SOCIETY MEMBER = £250

NON-MEMBER RATE = £300

NOTE: MEMBERS OF THE BMSS OR THE RSC MAY APPLY AT CHROMSOC MEMBERS' RATES

NOTE: VAT at 20% is additionally charged on all prices

TO REGISTER, BOOK YOUR EXHIBITION STAND AND SPONSORSHIP PLEASE CONTACT

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Please note: Chromsoc bursaries are available for bona-fide students to assist them to attend this symposium.

The Chromatographic Society - website www.chromsoc.com - will publish future updates of the symposium programme as it develops.