

Recent Advances in Sample Preparation Techniques Meeting Report

Wednesday, 27th October 2010, LGC Ltd, The Heath Business Park, Runcorn Conference Centre, Cheshire

The joint meeting facilitated by the North West Region and Separation Science Group of the Analytical Division attracted 90 delegates from across the United Kingdom and was supported by a wide range of manufacturers including: Biotage, Mettler Toledo, Supelco, Thames Restek Ltd., Crawford Scientific, Anachem, Presearch Ltd., Markes International Ltd and Thermo Scientific Ltd. The meeting was organised by Professor Graham Mills (University of Portsmouth, Portsmouth, UK) and Dr Alan Handley (LGC Ltd., Runcorn, UK).

Professor Hans-Gerd Janssen (Unilever and University of Amsterdam, The Netherlands) kicked off the meeting with a plenary lecture on '*Innovations in gas chromatography: from sample preparation to data evaluation.*' The talk showed how modern gas chromatographs (GC) can now analyse high boiling compounds and with use of newer stationary phases very polar molecules. He highlighted the advantages of GC x GC methods, pyrolysis and thermochemolysis for the comprehensive analysis of very complex mixtures such as oils and polymers. These techniques have led a small renaissance in the use of GC in the analytical community. Ray Perkins (Anatune Ltd., Cambridge) presented a talk on '*Automation in sample preparation.*' He showed how automation could increase sample throughput and then when on to demonstrate some of the new instrumentation for this purpose available from Markes International Ltd. After the coffee break, Tom Lynch (BP Technology Centre, Pangbourne) gave an insightful tour of the different '*Sample preparation methods used in the petro-chemical industry.*' He gave a number of interesting examples from Formula 1 Racing where advanced instrumental techniques have been used to rapidly discover the underlying reasons for mechanical failures arising at the race

track. Professor John Dean (Northumbria University, Newcastle-upon-Tyne) discussed the *'Potentially toxic element and polycyclic aromatic hydrocarbon inputs to urban street dust and the role of oral bio-accessibility testing.'* John described the optimisation of microwave and other sample preparation/ dissolution techniques for the analysis of heavy metals in street dust, and the in situ pressurised fluid extraction systems for the determination of PAH's by GC/MS . The morning session concluded with a second plenary lecture by Professor Paul Haddad (University of Tasmania, Tasmania) on *'Polymeric monoliths for sample preparation in bioanalysis.'* Professor Haddad showed how a number of reactions could be used to chemical modify monoliths and thereby be tailored for specific applications. He used the example of dried blood spots collected onto cards of blotting paper that are used in drug monitoring studies. Such cards give very irreproducible results and these could be replaced by using specially modified monolith surfaces. Over the lunch break there was a large vendor's display of sample preparation equipment in two rooms.

The afternoon session was started by Dr Tony Edge (Thermo Fisher Scientific, Runcorn) whose presentation was entitled *'Seeing the unseen in sample preparation.'* Dr Edge discussed the importance of sample preparation techniques in bioanalysis. He described their work on monitoring complex endogenous components and the improvements to analytical data through optimising SPE procedures. Then Dr Tony Berry (University of Glamorgan, Pontypridd) changed the theme and highlighted some of the problems associated with the analysis of hair in his talk *'What's in hair – the extraction of difficult sample matrices?'* Dr Berry showed how methods such as solid-phase micro-extraction and super-critical fluid extraction methods can be used to isolate a number of different drugs found in hair and how this can be applied to samples for both medical and forensic purposes. The meeting concluded with a third plenary lecture from Professor Colin Creaser (University of Loughborough, Loughborough) who discussed *'Who needs sample preparation? Direct analysis combined with mass spectrometry and ion mobility-mass spectrometry?'* Colin highlighted the various sample preparation options for mass spectrometry and the potential of "direct analysis" using ion mobility MS to integrate the preparation and measurement stages for high throughput analysis.

Overall the meeting was deemed as very successful with a diverse range of topics related to sample preparation discussed. It is hoped that the two groups will repeat their collaboration and run a follow up meeting in a few years time.

Graham Mills and Alan Handley, December 2010