CORESTA CONGRESS - ABSTRACT FORM

Please provide the following information.

Title:	Application of multi-dimensional GC techniques to the analysis of cigarette smoke
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Abstract Body (180-300 words)**:**

Tobacco smoke is an extremely complex and dynamic aerosol consisting of liquid/solid droplets (particulate phase) suspended in a mixture of gases and semi-volatiles (gaseous phase). It is formed during overlapping processes of oxidation, pyrolysis, pyrosynthesis, distillation, sublimation, condensation, filtration and elution. Smoke is emitted either as the mainstream smoke from the cigarette filter or emitted from the smouldering cigarette in the form of sidestream smoke. Mainstream smoke consists of over 6000 identified compounds and some reports claim the number of unidentified compounds might reach up to 100,000.

Methods have been developed for the separation and identification of mainstream smoke constituents that include headspace solid-phase microextraction (HS-SPME) and comprehensive two-dimensional gas chromatography (GC×GC) coupled to time-of-flight mass spectrometry (TOFMS). Such approaches allow evaluation of the profiles of volatile and semi-volatile compounds present in mainstream tobacco smoke. Data analysis methodology has been developed and used to evaluate the capability to distinguish quantitative or qualitative differences between samples by the use of statistical comparison and principal component analysis (PCA).

Examples will be presented of chemical profile differentiation, for example, those associated with modifications to cigarette filter materials and the potential use of this technique for characterisation of non-combustible products.

Key Words:	Gas chromatography, time of flight mass spectrometry, mainstream cigarette smoke, statistical evaluation, chemical profile.