CORESTA
Report to CEN/TC437

Dr Stéphane Colard, Secretary General

November 12, 2020

STATUTES & RULES ARE PUBLICLY AVAILABLE

CORESTA

Cooperation Centre for Scientific Research Relative to Tobacco

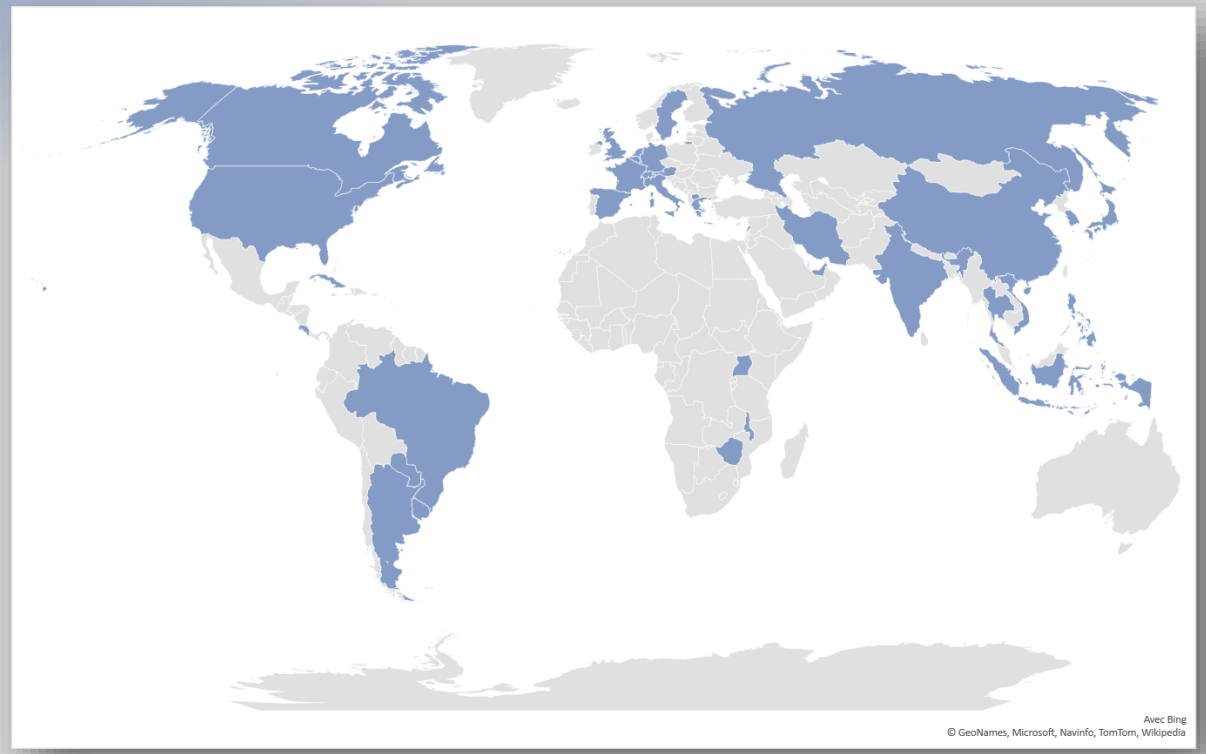
A non-profit organisation created in 1956 governed by French law

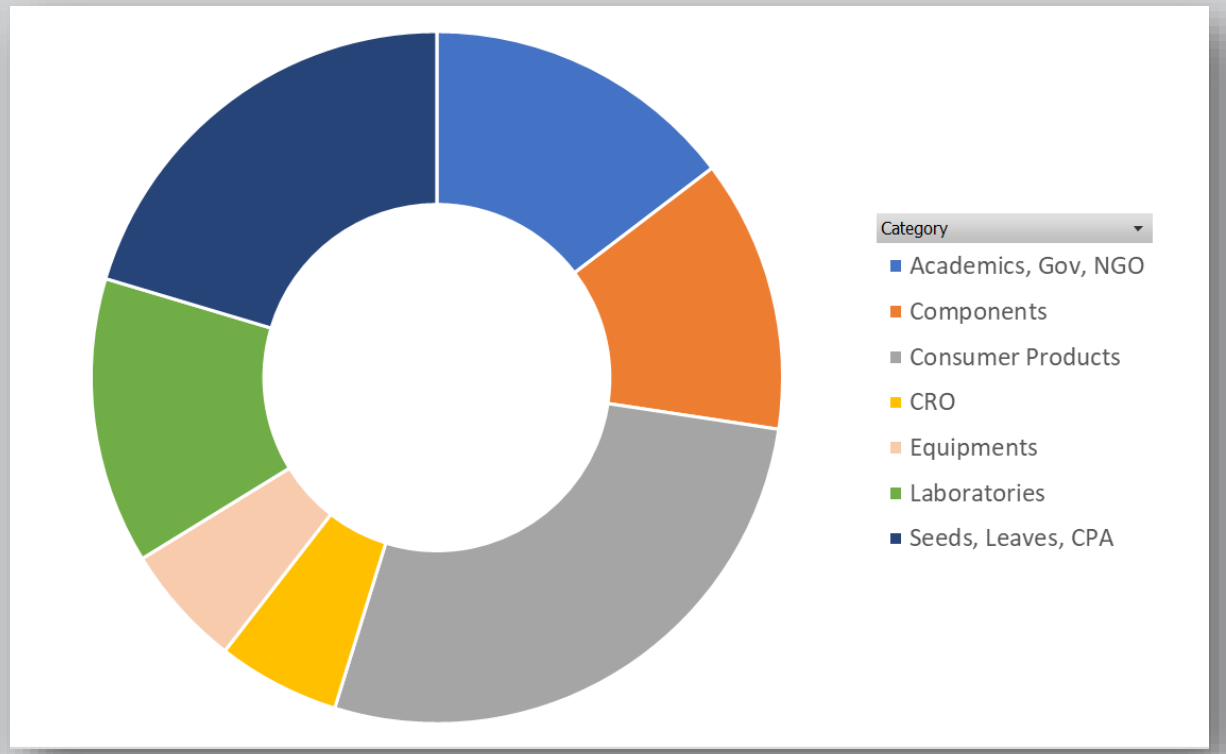
Purpose

To promote cooperation in scientific research relative to tobacco and its derived products

Membership

158 organisation members (October 2020)

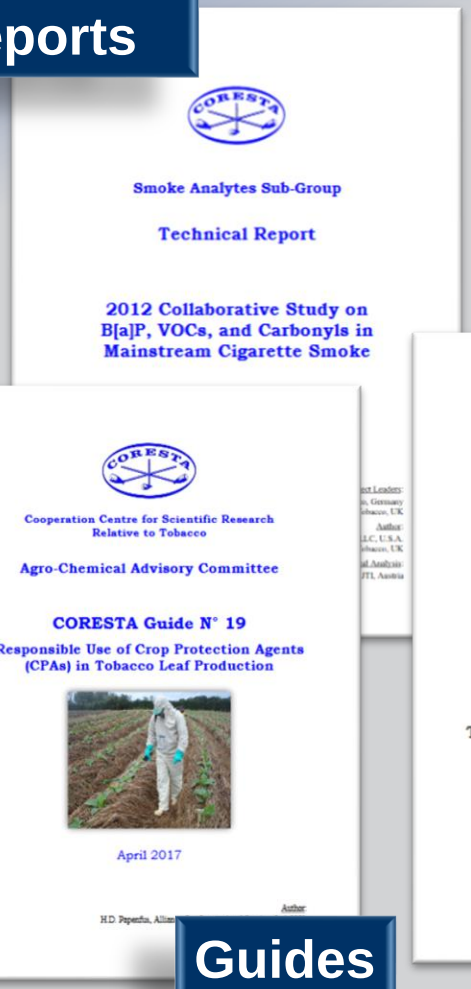




> 600 participants across 25 Sub-Groups and Task Forces

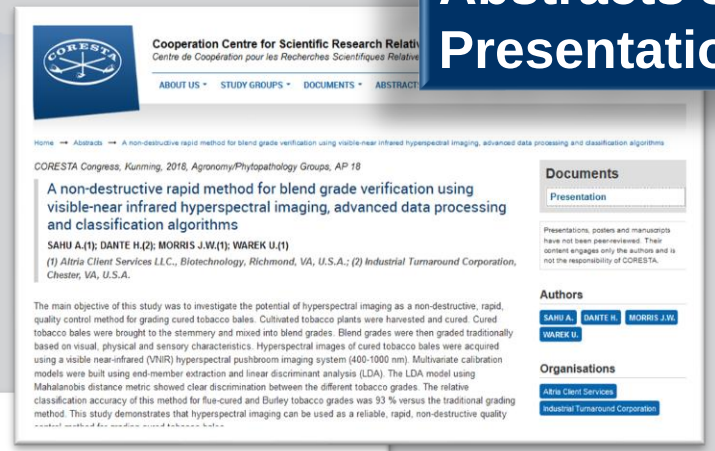
Projects, reports, documents, … are publicly available

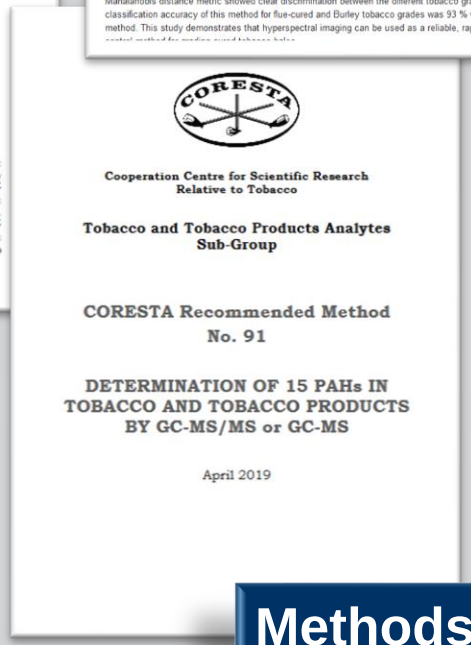
Technical Reports



Guides

Abstracts & Presentations

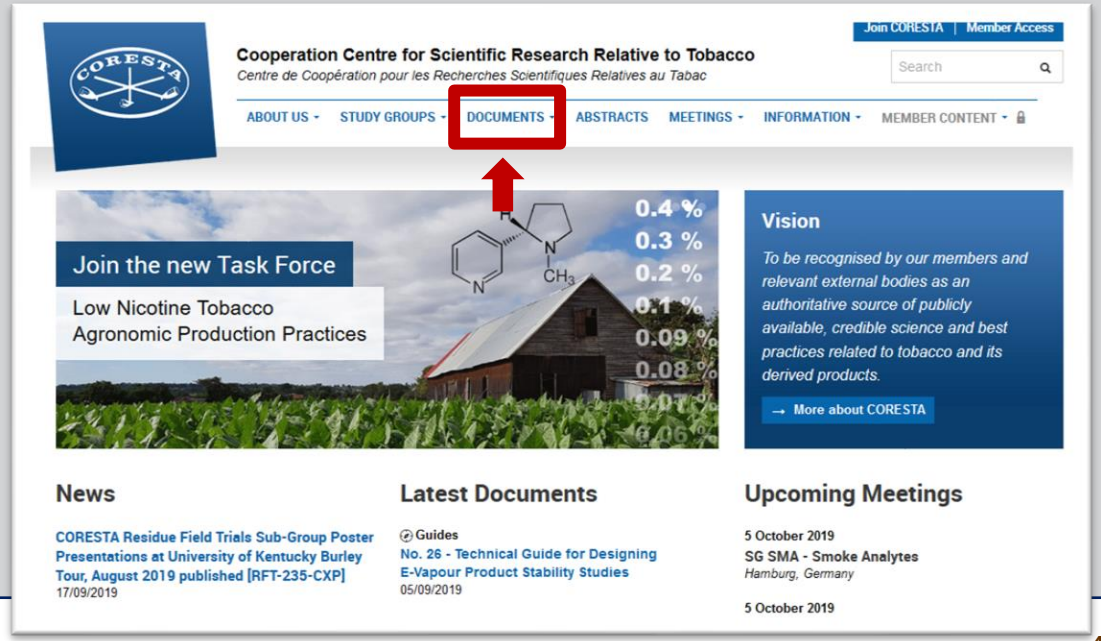




Methods

~ 9000 abstracts/presentations

www.coresta.org



Spectrum of Scientific Cooperation Topics

- Integrated Pest Management
- Virus Diseases
- Extended Diagnostic Expert System
- Efficacy of Biological & Eco-Friendly Crop Protection Agents
- Collaborative Study Black Shank
- Tobacco Alkaloid Genetics
- Tobacco Biotechnology and Omics

- Physical Test Methods
- Cigar Smoking Methods
- Tobacco and Tobacco Products Analysis
- Cigarette Variability
- E-Vapour

Created in 2013

- Heated Tobacco Products

- Agrochemicals Analysis
- Pest and Sanitation Management in Stored Tobacco
- Proficiency Testing for Detection of Transgenic Tobacco
- TSNA in Air-cured and Fire-cured Tobacco
- Agrochemical Residue Field Trials
- Collaborative Study of Low Nicotine Tobacco Agronomic Production Practices

- Product Use Behaviour
- Smoke Analysis
- *In Vitro* Toxicity Testing
- Biomarkers
- Consumer Reported Outcome Measures Consortium
- 21st Century Toxicology for Next Generation Tobacco and Nicotine Products

Electronic Cigarettes: CORESTA Working Groups

- Several working groups conduct scientific projects relative to electronic cigarettes

Focus on

- EVAP / E-Vapour
- PUB / Product Use Behaviour
- CROM / Consumer Reported Outcome Measures
- BMK / Biomarkers
- NGTX / 21st Century Toxicology for Next Generation Tobacco and Nicotine Products

Activity Reports publicly available on our website

E-Vapour SG Scope and Membership

- **Objectives:**
  - To identify areas of scientific research and conduct studies that will characterize liquids, e-vapour product emissions, and device properties and performance
  - To develop and publish methods and guides
  - To organize and conduct periodic proficiency/collaborative studies of identified constituents in liquids and/or e-vapour product aerosol
- **SG membership**
  - ≈ 50 people from US, EU, Asia
  - E-Vapour Product Companies, Suppliers, Contract Labs, Regulatory Agencies, Academia, Others, …...
- **Recent accomplishments**
  - May 20: Technical Report on Metals Analysis Method for E-liquids published on the CORESTA website
  - Nov 20: Collaborative Study for the Determination of Formaldehyde & Acetaldehyde in E-Vapour Prod.
- **Current work on: carbonyls in aerosol, reference device, metals LOD/LOQ and degradants in e-liquid**

Current Work

- Carbonyls in aerosol
- Reference device
- Metals LOD/LOQ
- Degradants in e-liquid

Carbonyl in Aerosol - Method

Carbonyls in Aerosol

Method Selection: HPLC with DNPH

Study Protocol

- Harmonized Device: Aspire Tank and Evolv DNA power supply
- Compounds included: formaldehyde and acetaldehyde
- Three e-liquids, unflavored, tobacco and menthol
- Samples fortified at three levels (0, 15, 25 and 35 µg/ml) immediately before analysis
- Aerosol samples collected using 55/3/30 CORESTA CRM 81 puffing
- Collected ~300 mg of aerosol per liquid and spiking level, in triplicate

Carbonyls in Aerosol

Why use fortified e-liquids?

- The native production of formaldehyde and acetaldehyde is expected to be both low and variable in the un-spiked aerosol, based on pre-study work.
- Formaldehyde and acetaldehyde added to e-liquids will transfer into the aerosol, based on pre-study work.
- Assumption: Adding a known amount of formaldehyde and acetaldehyde to the native amount produced by each device should improve the consistency of measurements and correct for device to device differences.

Carbonyls in Aerosol - Results

- Fortified e-liquids reduced the Repeatability (r) and Reproducibility (R) Limits for the study
- Average %R for formaldehyde was 52 %, at 35 µg/g fortification level
- Average %R for acetaldehyde was 111 %, at 25 µg/g fortification level
- Draft CRM is in preparation; publication early 2021

Reference Device Study

Reference Device

Method Selection

- CRM 81 and CRM 84

Study Protocol

- Harmonized Device: Aspire Tank and Evolv DNA power supply
- Compounds included: nicotine, propylene glycol, glycerin and water
- Three e-liquids: unflavored, tobacco and menthol
- Study extended to allow maximum participation: 11 Labs

Reference Device

- Proposed reference device produced aerosol with an average Reproducibility (R) of 34 %
- Average %R for PG was 17.5 %, normalized to ACM
- Average %R for Glycerin was 16.2 %, normalized to ACM
- Average %R for Nicotine was 15.6 %, normalized to ACM
- SG agreed to recommend this device as a reference product
- Technical Report to be published end 2020

Metals LOD/LOQ

Metals LOD/LOQ

- **Observations**
  - Filter pad-based trapping systems contain some analytes of interest
  - Other trapping system may also contain some analytes of interest
  - Reported values are impacted by trapping system

- **Technical Guide publication expected by end of 2020**
  - Recommend best practice for determining method LOD/LOQ values
  - Recommend best practice to handle contribution from trapping system

Nicotine Degradants* in E-liquids: Proficiency Study

*Anabasine Anatabine β-Nicotyrine Cotinine Myosmine NicotineN'-Oxide Nornicotine

Nicotine Degradants

- **Proficiency Study: laboratories use their in-house methods**
- **Samples: 9 total**
  - 4 e-liquids: aging or fortified with target compounds
- **Report z-scores and method synopses**
- **Technical Report published in September 2020**

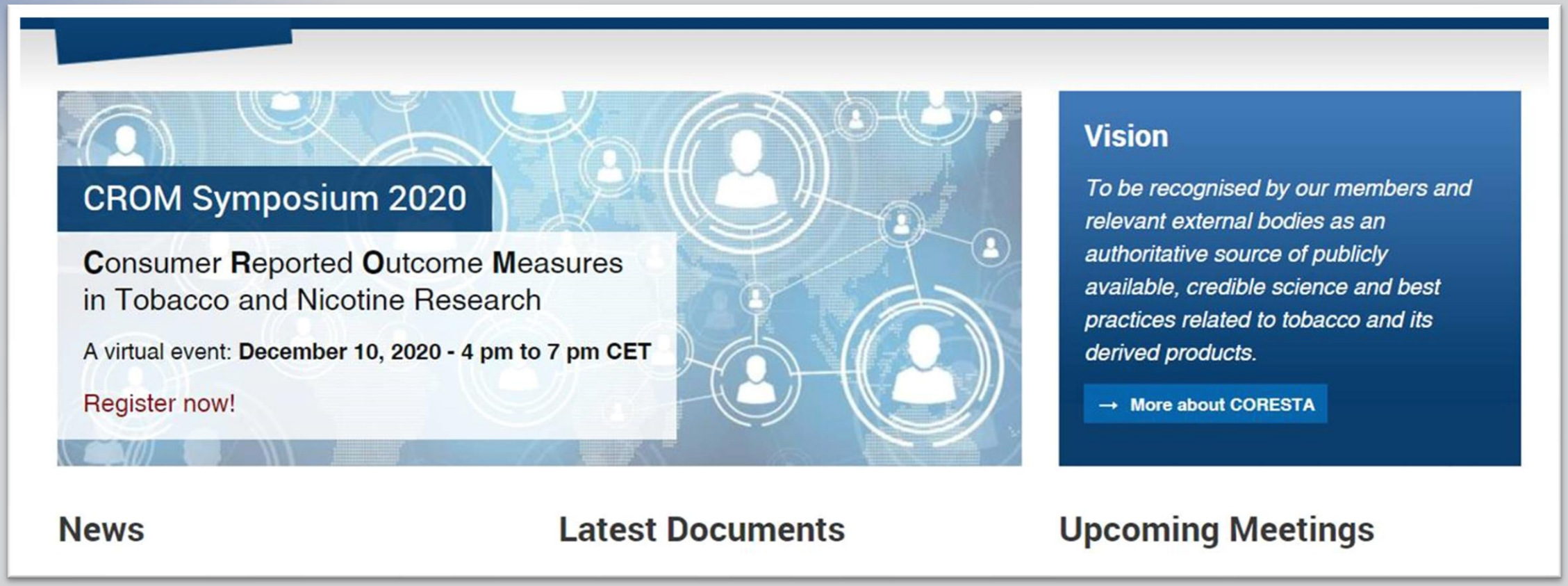

2020 Online
CORESTA Congress

2020 Online CORESTA Congress

Abstract No. / Abstract ID	Oral Presentation
ST 03 1684	**Method development for the analysis of mono-carbonyl compounds in e-vapor products by LC-MS** ZHU J.; HEREDIA A.; TWEEDY J.; TAYYARAH R. *ITG Brands and Fontem USA, P.O. Box 21688, Greensboro, NC 27420, U.S.A.*
ST 04 1785	**Method optimization on analysis of TSNA in electronic cigarette liquids and N-nitrososarcosine (NSAR) in smokeless tobacco by UHPLC-MS/MS** WU J.; QIN F. *PerkinElmer Health Sciences Canada, Inc., 501 Rowntree Dairy Road, Unit 6, Woodbridge, Ontario L4L 8H1, Canada*
ST 05 1814	**Determination of glycidol in e-liquids and emissions from e-cigarettes** WANG J.; RODRIGUEZ-LAFUENTE A.; JOZA P. *Labstat International Inc., 262 Manitou Drive, Kitchener, Ontario N2C 1L3, Canada*

Abstract No. / Abstract ID	Poster Presentation
STPOST 05 1663	**A screening method by gas chromatography–mass spectrometry for the quantitation of 33 aerosol constituents from a heat-not-burn tobacco product** HOFER I.; GAUTIER L.; CORTES SAUTEUR E.; DOBLER M.; PYTHON A.; O'REILLY C.; GISI D.; TINGUELY E.; WEHREN L.; GARCÍA FIDALGO E.; CUKURCAM L.; HENNEMANN M.; MATERA R.; ROTA D.; SANTOS CH.; SEQUEIRA C.; EPARS T. *Philip Morris Products S.A., PMI R&D, Quai Jeanrenaud 5, CH-2000 Neuchatel, Switzerland*
STPOST 06 1711	**Assessment of filter pre-treatment for metal analysis in e-vapour aerosol** IMAI R.; NAGAE H.; FUKAI Y.; SHIMAZU A.; TAKAYAMA H. *Japan Tobacco Inc., Scientific Product Assessment Centre, 6-2, Umegaoka, Aoba-ku, Yokohama, Kanagawa 227-8512, Japan*
STPOST 07 1798	**New developments in vacuum photoionisation TOF-MS technique to analyse smoking products on-line and in real time** EHLERT S.(1,2); HEIDE J.(2); WALTE A.(1); ZIMMERMANN R.(2) *(1) Photonion GmbH, Hagenower Str. 73, 19061 Schwerin, Germany* *(2) University of Rostock, Dept. of Analytical Chemistry, Dr.-Lorenz-Weg 2; 18059 Rostock, Germany*
STPOST 08 1815	**Determination of α-tocopherol acetate (vitamin E acetate) in e-liquids and cannabis liquids samples - a comparison between HPLC-DAD and LC-MS/MS methods** RODRIGUEZ-LAFUENTE A.; JOZA P. *Labstat International Inc., 262 Manitou Drive, Kitchener, Ontario N2C 1L3, Canada*

Publicly available soon.



Online open event but limited to 300 participants

Thank you for your attention