NOVEL FTIR ONLINE METHOD FOR E-CIGARETTE AEROSOL CHARACTERIZATION

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FTIR Results: Benchmark with Qualified Methods

FTIR Results: Static vs Dynamic (Example Acetaldehyde)



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 Novel FTIR puff-by-puff system developed and calibrated for key e-cig aerosol constituents Determined correction factors (6 s exhaust): H₂O: 0.64; Nicotine: 0.60; Glycerol: 0.52; PG: 0.62; Acetaldehyde: 0.63 The correction factors were confirmed by using the peak integral for the quantification of chemicals. FTIR results are in good agreement with standard liquid and aerosol analysis results. Observed deviations in low water containing liquids due to water uptake from Glycerol and PG. Glycerol & PG show linear response over 3 orders of magnitude, while Nicotine is linear over 2 orders of magnitude. 	"Puff" (=Dynamic) Volume = 30, 55, 70, and 100 mL "Puff" (=Valve) Duration = 6 s "Puff" Period = 30 s
	References
Future Outlook	 1. FTIR Method for E-Cigarette Aerosol Characterization, F. Radtke, 70th Tobacco Science Research Conference (2016) PMIScience: <u>https://www.pmiscience.com/library/ftir-method-e-cigarette-aerosol-characterization</u> 2. Coresta Method CRM N° 81, <u>https://www.coresta.org/routine-analytical-machine-e-cigarette-aerosol-generation-and-collection-definitions-and-standard</u>
 Calibrate the instrument for further aerosol constituents Apply the FTIR gas analysis to more complex matrices (e.g. heat-not-burn products) Increase the throughput of online aerosol analysis 	 <i>Puff-by-Puff and Intrapuff Analysis of Cigarette Smoke Using Infrared Spectroscopy</i>, Parrish, M.E. et al., Vibrational Spectroscopy, 27, 29-42 (2001) Quantum Cascade Infrared Laser Spectroscopy for Real-Time Cigarette Smoke Analysis, Shi, Q. et al., Analytical Chemistry, 75, 5180-5190 (2003)
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