SUPPORTING INFORMATION

E-cigarette airflow rate modulates toxicant profiles and can lead to concerning levels of solvent consumption

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10 Pages, 2 Tables, 5 Figures

Table S1. Representative examples of toxicant concentrations and machine puffing flow rates from the studies assessing emissions from electronic cigarettes.

Study	Calculated Flow Rate (mL/s)	E-liquid Composition[a]	E-Cigarette	Acetaldehyde (ng/puff)	Acrolein (ng/puff)	Formaldehyde (ng/puff)
1	10	PG/GLY mixtures with vanilla flavor; 18 mg/mL of nicotine.	Vision Spinner II B e-cigarette operated at 3.8V with Aerotank Mini by Kangertech (2.0 Ω coil) vaporizer.	2132[b]	984[b]	10660[b]
			Vision Spinner II B e-cigarette operated at 3.8 V with CE4 by eGO (2.6 Ω coil) vaporizer.	9282[b]	8670[b]	45645[b]
		GLY with no additives	Vision Spinner II B e-cigarette operated at 3.8 V with CE4 by eGO (2.6 Ω coil) vaporizer.	10925[b]	8314[b]	83699[b]
		PG with no additives	Vision Spinner II B e-cigarette operated at 3.8 V with CE4 by eGO (2.6 Ω coil) vaporizer.	40068[b]	819[b]	29358[b]
2	17	PG/GLY with tobacco flavor, 0.90% labeled nicotine level.	The third-generation e-cigarette with Eleaf, ISTICK battery and Kayfun 3.1 atomizer with 1.6 Ω coil, operated at 5, 10, 15, 20, 25 W.	348.4[c]	2.5[c]	1559.9[c]
3	14	PG/GLY solution, 2% nicotine, no flavorings added.	Five "tank system" e-cigarettes with 4 coils ranging from 2.2 to 2.8 Ω operated at 3.8, 4.2, 4.6, and 5.0 V and one 0.72 Ω sub-ohm coil operated at 10, 15, 20, and 25 W.	41000[b,d]	5500[b,d]	51000[b,d]
4	28	PG/GLY with tobacco and menthol flavors.	Disposable cartridges and rechargeable e-cigarettes.	320	150	NA

5	39	Ten different PG, GLY and PG/GLY mixtures with tobacco and fruit flavors, 18-24 mg/mL of nicotine.	Ego-3 e-cigarette operated at 3.2 V, Crystal 2 clearomizer with 2.4 Ω heating element.	7.13[b]	ND	3.93[b]
		PG, GLY and PG/GLY mixtures with no additives.		28.66[b]	NA	35.33[b]
6	39	Twelve e-liquids with tobacco and menthol flavors, 16-18mg/mL of nicotine.	Disposable cartridges	90.6	279	374
7	18	Solvent composition not available, no nicotine.	The first-generation device operated with prefilled cartridges.	8000	3500	5000
8	13-17	PG/GLY mixture, no additives.	"Tank system" e-cigarette, operated at 5.0 V.	NA	NA	38000 (FRA)
9	28	Solvent composition not available.	Three hundred and sixty-three e-cigarettes (13 brands).	11550[b]	4015[b]	14300[b]
10	13	Four e-liquids with tobacco flavor, 24-26 mg/mL of nicotine.	Two-piece cartomizer.	20.06-65.87[b]	ND	23.93-55.*82*[b]
11	23	E-liquids with tobacco flavor, 16-18 mg/mL of nicotine.	Nine e-cigarettes: Refillable and disposable, non-refillable e-cigarettes.	40.6-106.4	9.1-167.3	33.6-175
12	10	Flavored and unflavored PG/GLY based mixtures, 12-18 mg/mL of nicotine.	Two clearomizers with 1.5 and 3.1 Ω coils operated at 4.0 and 3.9 V, respectively and one cartomizer with 3.4 Ω coil operated at 4.2 V.	27700	2720	49500
13	8	PG/GLY mixtures.	Japanese e-cigarette by “The Plemium Smoker”; no information about device power settings or coil resistance.	605[b]	511.5[b]	456.5[b]

14	23	Cartridges with tobacco, menthol, vanilla and cherry, 16 mg/mL of nicotine.	Cartridge-based electronic cigarette (the first generation), output battery voltage 3.7 V, coil resistance 3.0 Ω.	57	24	62
		Cartridges with various flavors, including menthol and tobacco, 6 mg/mL of nicotine.	"Tank-type" e-cigarette (the second generation) with iTaste VV V3.0 battery (voltage output of 3.3−5 V) and EVOD2 atomizer by KangerTech (coil resistance 1.5 Ω); e-cigarette was tested at 9.1 W (3.7 V).	6310	580	4040
15	19[e]	PG based mixture with "Watermelon Chill" flavor, 0 or 18 mg/mL of nicotine.	Direct Dripping Atomizer, 2.5 Ω coil, with eGo-T battery operated at 3.4 V.	78149	131	5871

[a] Nicotine levels are nominal not actual.
[b] Units were normalized to ng/puff.
[c] Device operated at 20 W.
[d] Maximum yields reported at operational voltage of 5 V.
[e] Actual flow rate.

Figure S1. Experimental set-up.

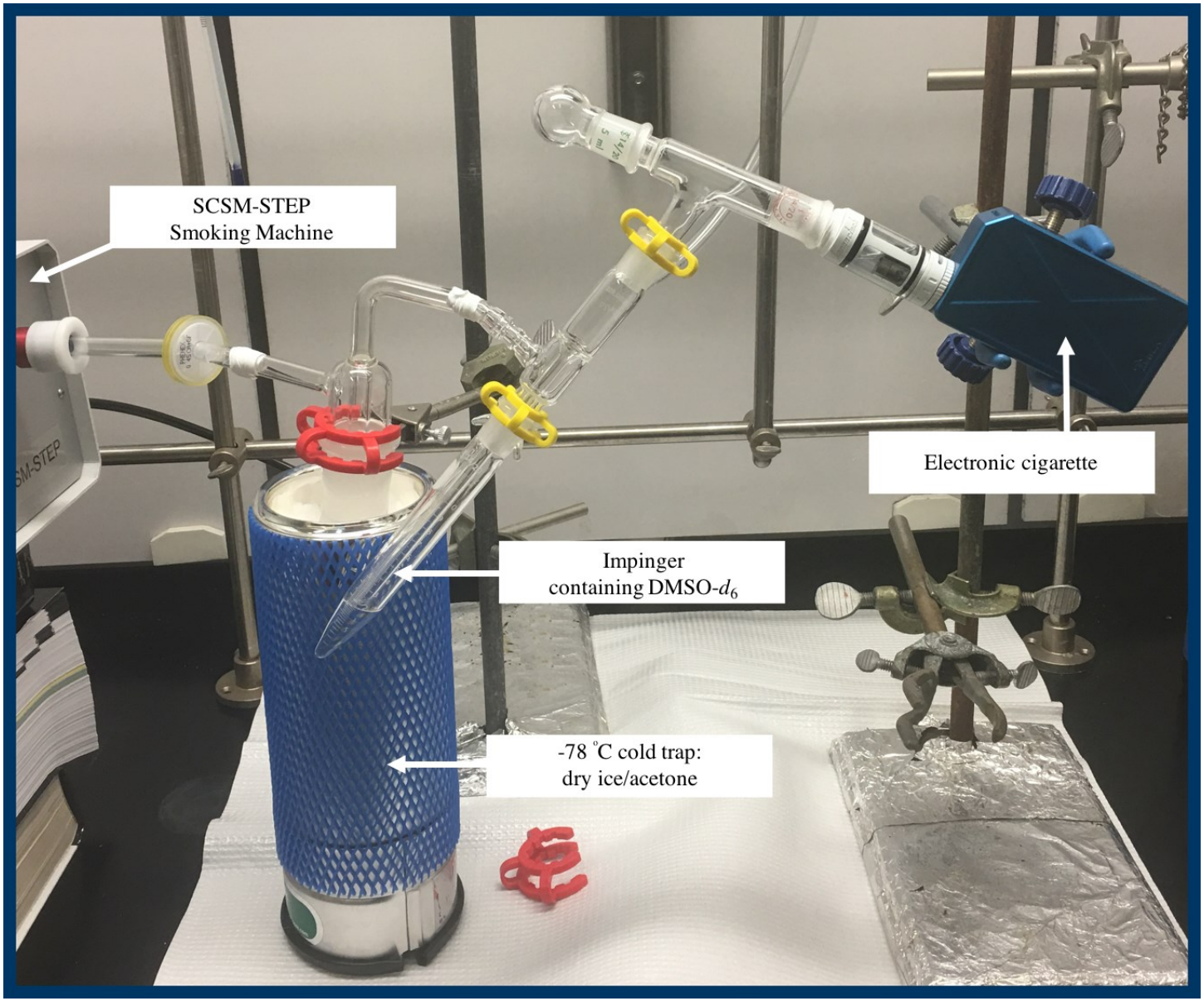


Table S2. Levels of detection and quantification for toxicants under investigation.

	Acetaldehyde (µg/g)	Acrolein (µg/g)	Propanal (µg/g)	Hydroxyacetone (µg/g)	Glycolaldehyde (µg/g)
LOD	0.268	2.03	1.48	0.328	0.984
LOQ	0.893	6.78	4.94	1.09	3.28

Figure S2. Vapor Density.

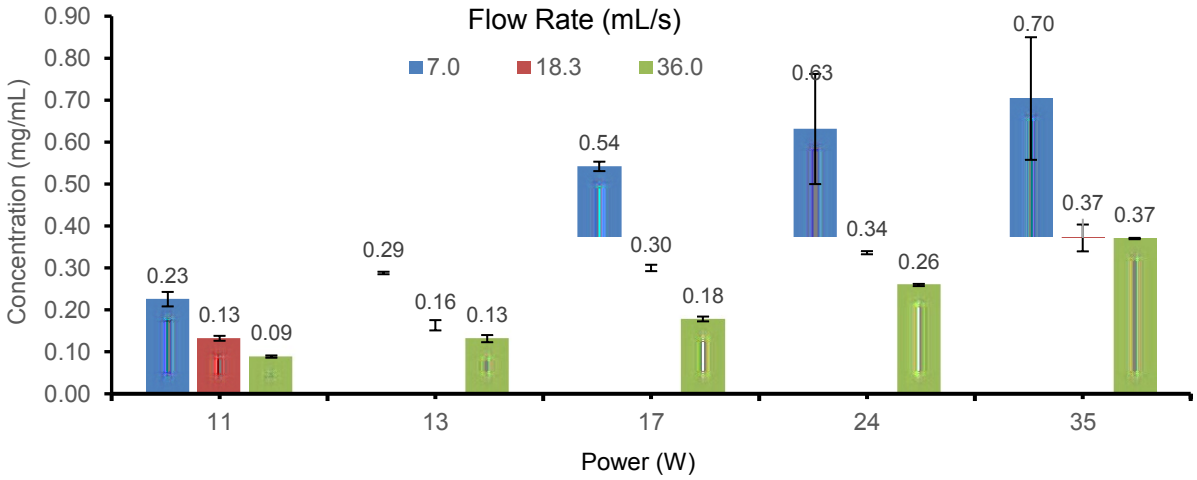


Figure S3. ^{1}H NMR spectra of representing vaporized samples collected under varying vaping conditions: 18.3 mL/s (spectrum A) and 7.0 mL/s flowrates (spectrum B).

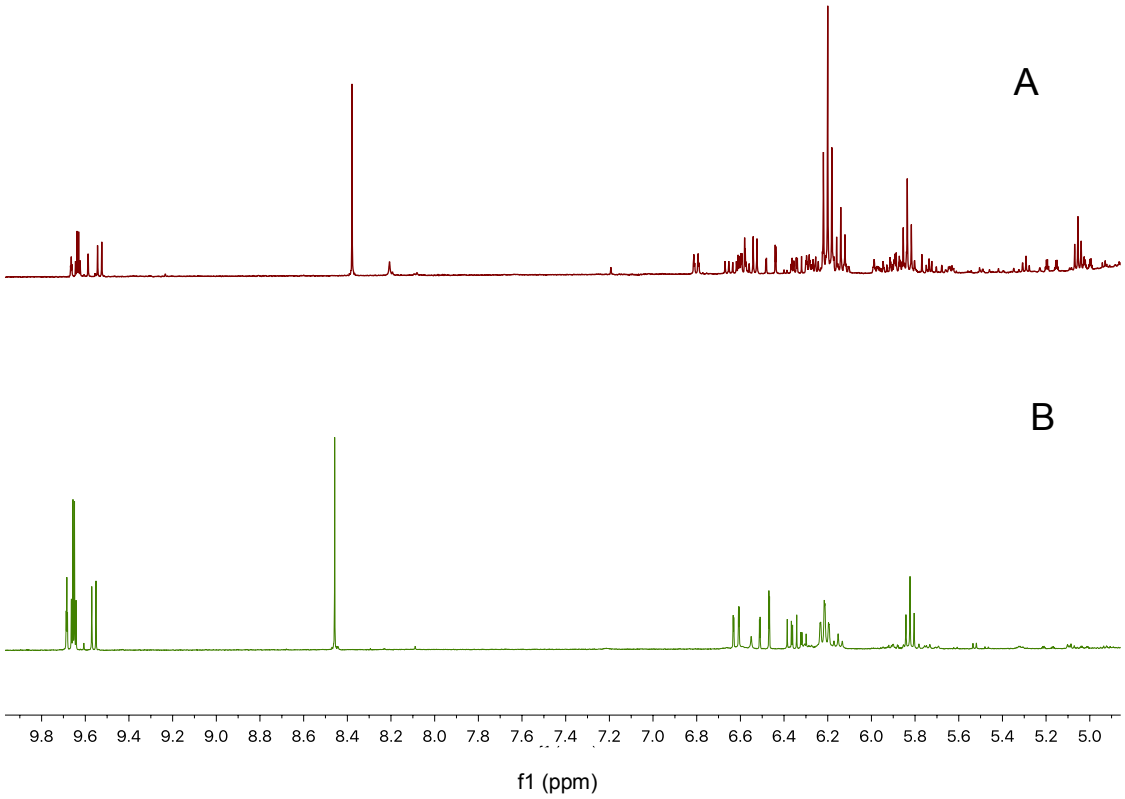


Figure S4. ^{1}H NMR spectra expansion of representing samples collected under varying vaping conditions: 18.3 mL/s (spectrum A) and 7.0 mL/s flowrates (spectrum B).

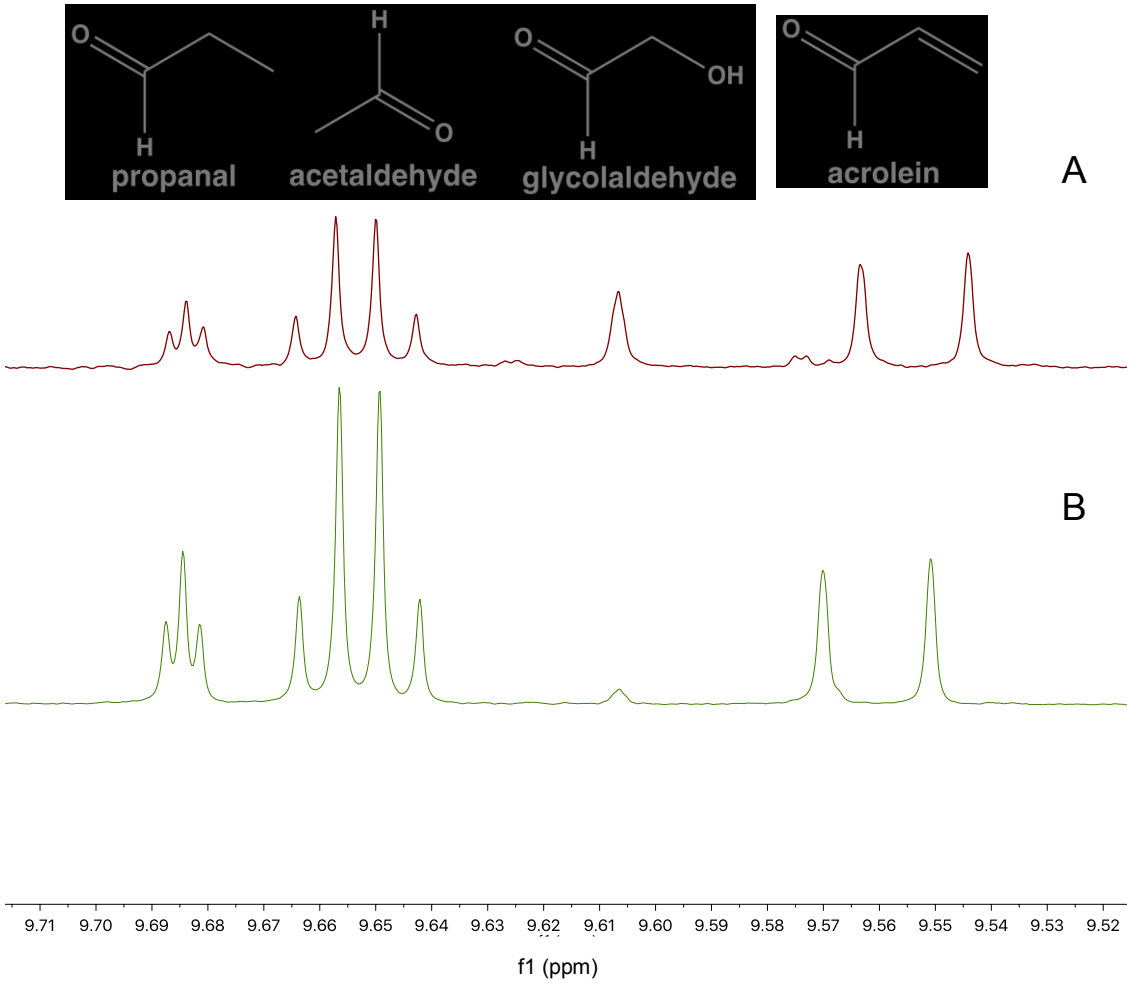
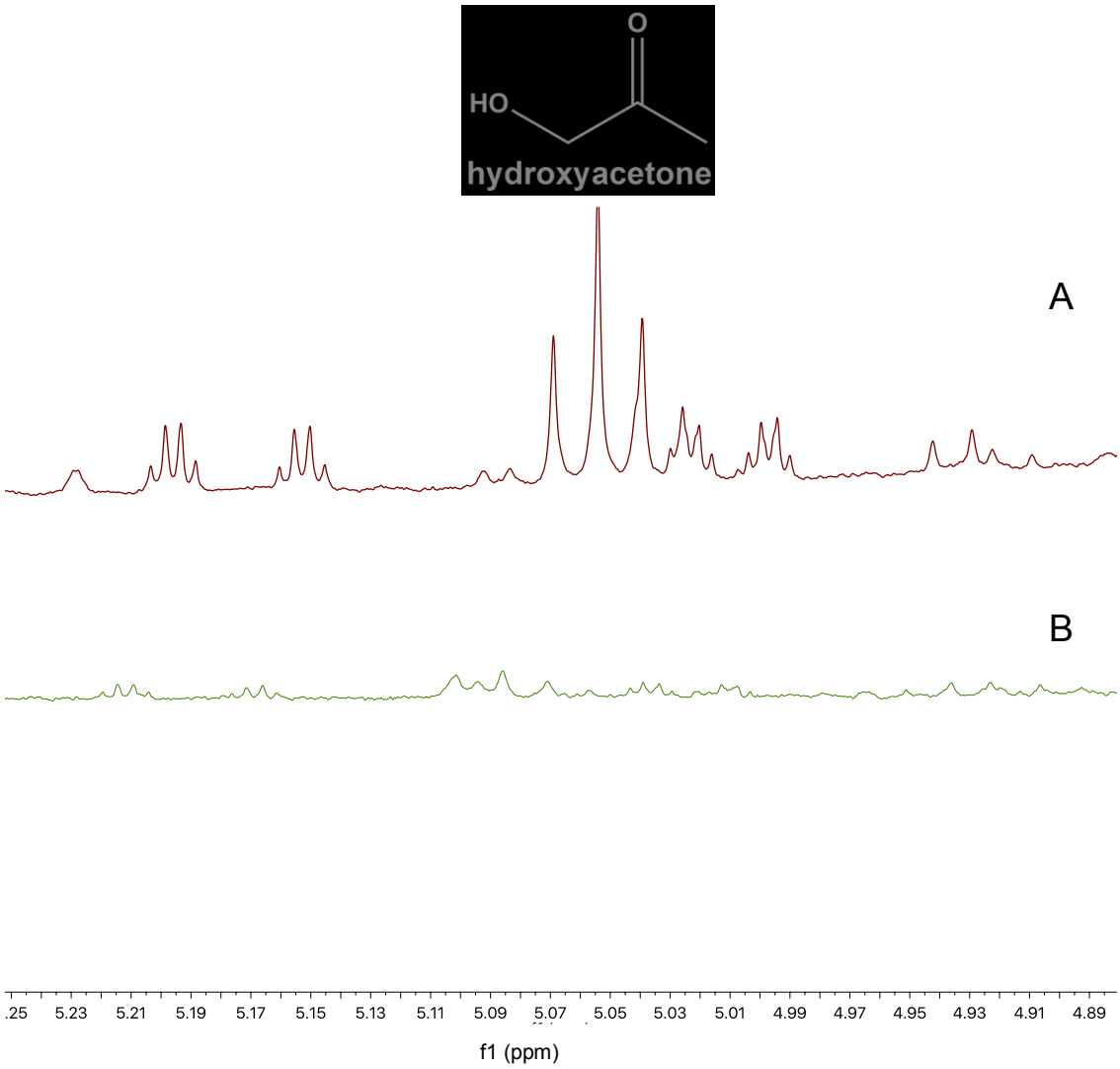


Figure S5. ^{1}H NMR spectra expansion of representing samples collected under varying vaping conditions: 18.3 mL/s (spectrum A) and 7.0 mL/s flowrates (spectrum B).



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