

Supporting Information

"Holographic detection of hydrocarbon gases and other volatile organic compounds"
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Table S1. Sensor response to maximum concentration, standard deviation, boiling points, octanol-water partition coefficients¹, and cohesive energy densities² for the compounds used in this study.

Compound ³	$\Delta\lambda$ [nm]	S.D.	$\delta^{1/2}$ [MPa ^{1/2}]	log kow	B.P. [°C]
Ethane	3.0	0.02	11.6	1.8	-89.0
Propane	13.7	0.19	12.7	2.4	-42.0
Butane	62.8	4.54	13.5	2.9	-0.5
Iso-butane	42.5	0.54	12.8	2.8	-11.7
Ethylene	2.1	<0.01	11.3	1.1	-103.7
Butylene	51.0	0.39	13.7	2.4	-6.3
Propylene	11.3	<0.01	12.5	1.8	-47.6
Acetylene	2.7	0.58	11.0	0.4	-84.0
Butyne	76.2	0.15	28.5	1.5	7.8
Butanol	126.5	<0.01	23.3	0.9	117.2
Propanol	146.4	<0.01	24.3	0.3	97.1
Ethanol	52.7	<0.01	26.0	-0.3	78.4
Methanol	16.2	<0.01	29.7	-0.8	64.7
Propan-2-ol	153.9	<0.01	23.7	0.1	82.3
Acetone	181.5	<0.01	20.3	-0.2	56.5
Pentanol	97.7	<0.01	21.7	1.5	138.0
Propyne/Propadiene	14.0	<0.01	29.3	0.9	-48.0
Water	0.0	<0.01	47.9	-1.38	100
Butanone	267.8	<0.01	19.1	0.29	76.6
2,3-butanediol	1.3	<0.01	22.7	-	180.7
Iso-Pentanol	152.8	<0.01	20.5	1.16	131.2
Iso-Butanol	155.9	<0.01	21.5	0.76	105
Acetaldehyde	119.5	<0.01	21.1	-0.34	18.6
Ethylene Glycol	0.0	<0.01	29.9	-1.36	197.5
t-Butanol	300.0	<0.01	21.0	0.35	84.6
Glycerol	0.0	<0.01	43.2	-1.76	290

¹ Values from ChemSpider database, RSC (<http://www.chemspider.com>).

² Values collected from: Barton A.F.M. (1991), CRC Handbook of solubility parameters and other cohesion parameters, CRC Press; Kuo, Alex C. M. (1999), Poly(dimethylsiloxane) in Polymer Data Handbook, James E. Mark, Oxford University Press; Fried Joel (2003), Polymer Science and Technology, 2nd Ed, Prentice Hall; James E. Mark (2006), Physical properties of polymers Handbook, Springer; Allan, F. Barton (1990), CRC Handbook of polymer liquid interaction parameters and solubility parameters, CRC Press.

³ Other substances measured that exceeded the measurable response limit (in the infrared) as expected were: pentane, pentene, pentyne, heptane, octane, decane, hexane, heptanone, hexanol, pentanol, 4-methyl-2-pentanone, tert-amyl alcohol, iso-amyl alcohol.

Cyclohexanol	34.2	<0.01	23.3	1.23	159.6
Cycloheptanol	36.6	<0.01	-	2.13	181.8
Cyclooctanol	26.9	<0.01	-	2.62	203.2
Methylcyclopentanol	231.3	<0.01	-	1.60	137.1
PDMS	-	-	14.9-17.5	-	-

Figure S1. Rate of holographic response and equilibrium, numerical differentiation by finite differences; $d(\Delta\lambda)/dt = 0$ when equilibrium is reached after 9s for the gaseous hydrocarbon and after 120s for some alcohols tested in this study.

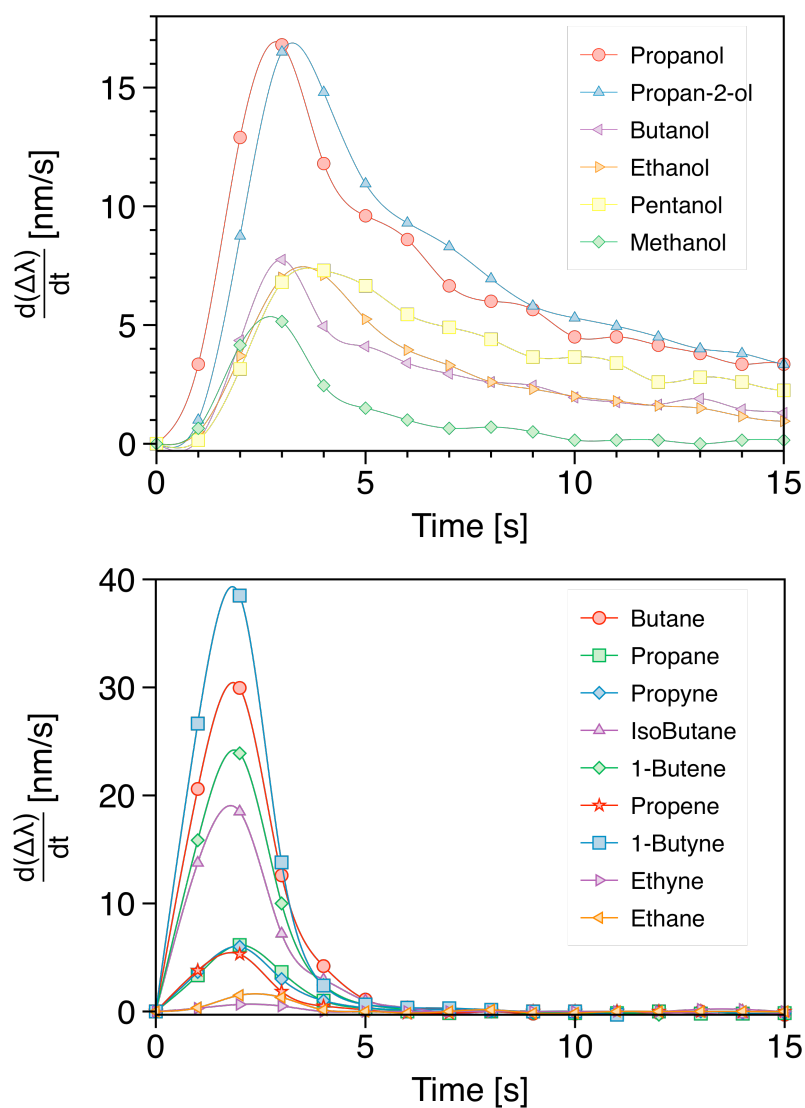


Figure S2. Blank response to atmospheric gases at different temperatures compared with response to water, 1-butanol, 1-butyne, 1-butene and n-butane at 22°C.

