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Supplementary Information

Nanoporous MIL-101(Cr) as a sensing layer coated on quartz crystal microbalance (QCM) nanosensor to detect volatile organic compounds (VOCs)

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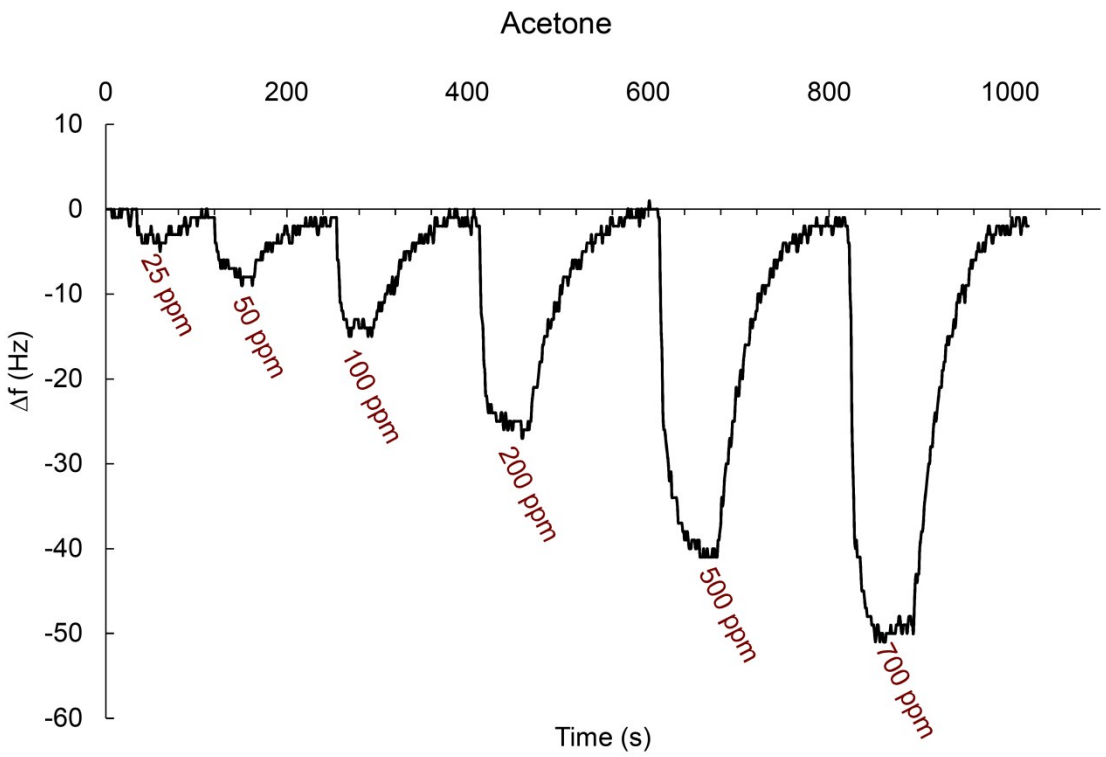

Fig. S1. Real-time sensor responses to acetone

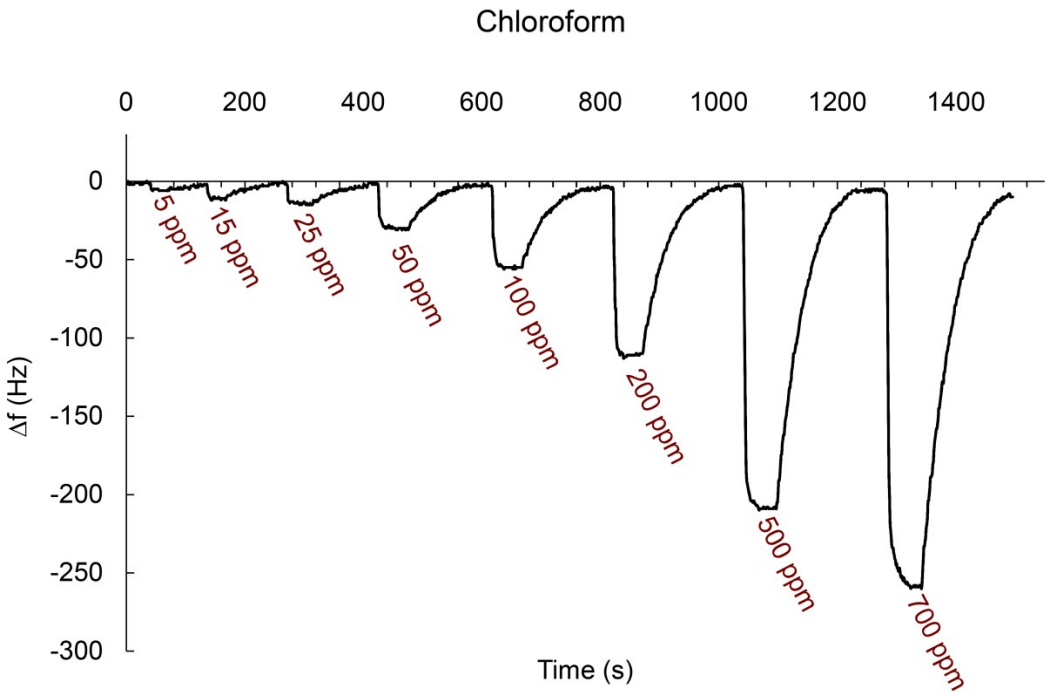

Fig. S2. Real-time sensor responses to chloroform

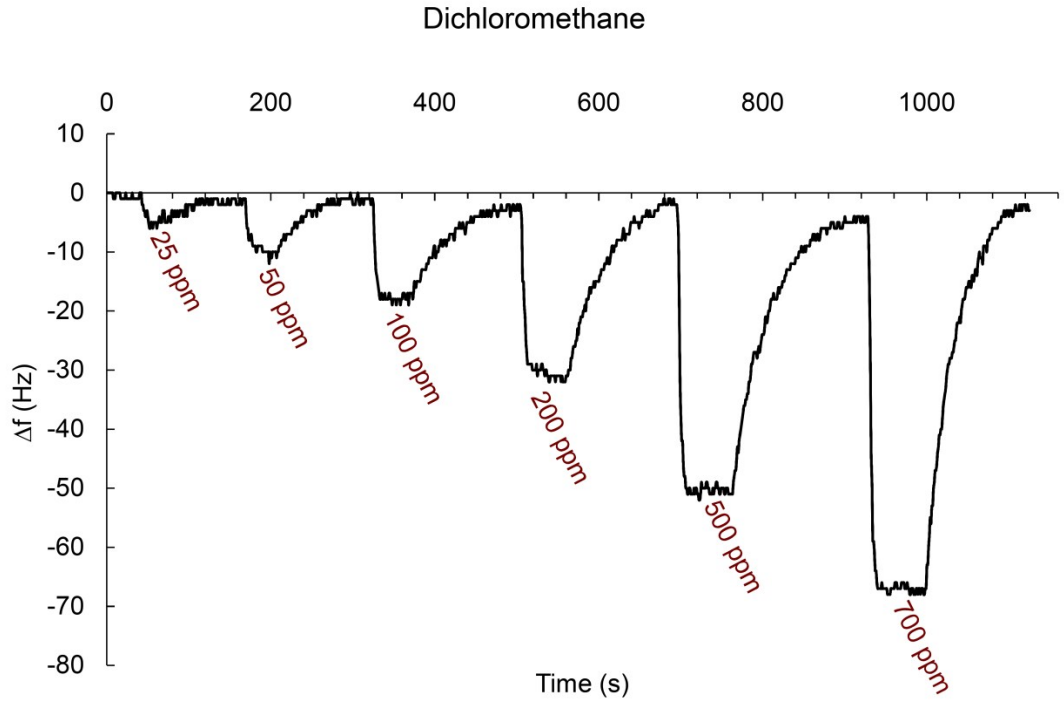

Fig. S3. Real-time sensor responses to dichloromethane

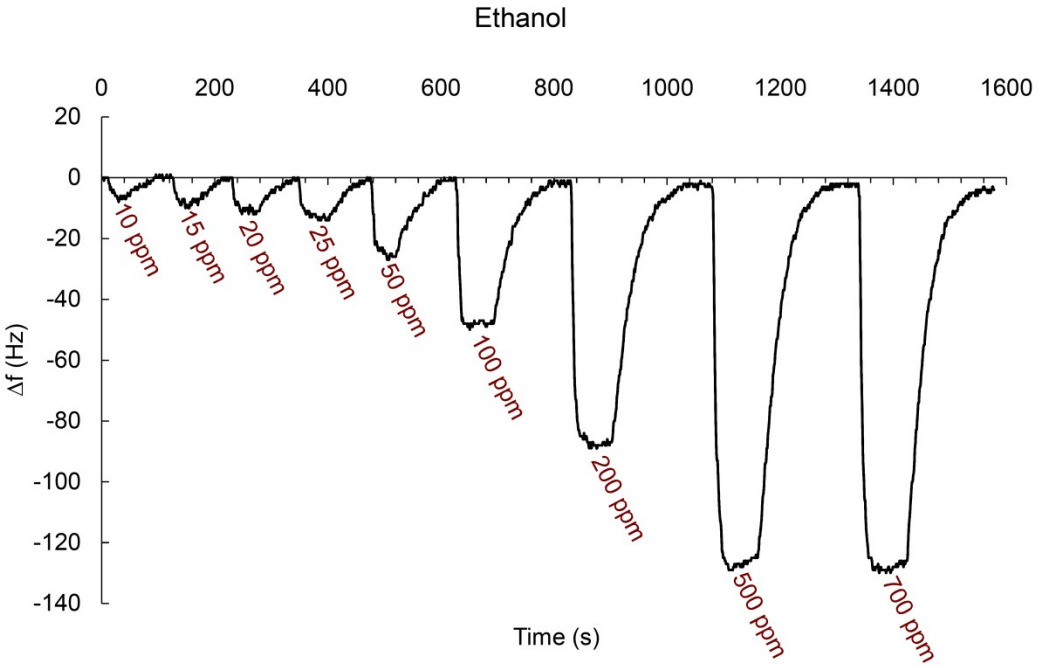

Fig. S4. Real-time sensor responses to ethanol

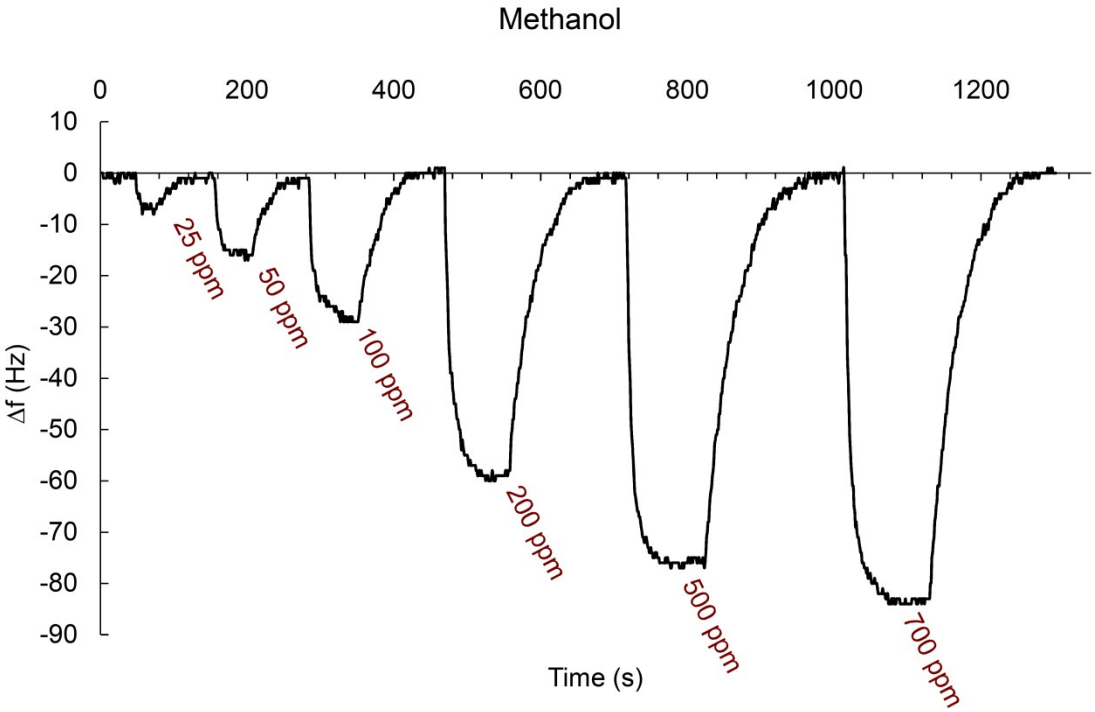

Fig. S5. Real-time sensor responses to methanol

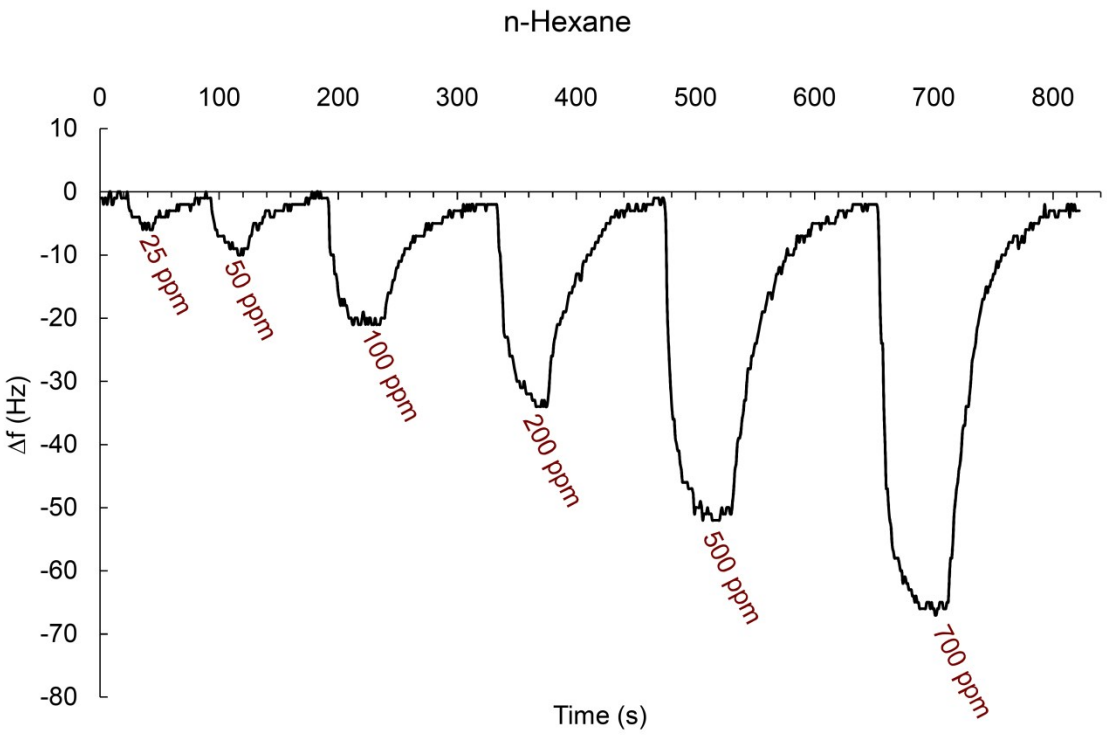

Fig. S6. Real-time sensor responses to n-hexane

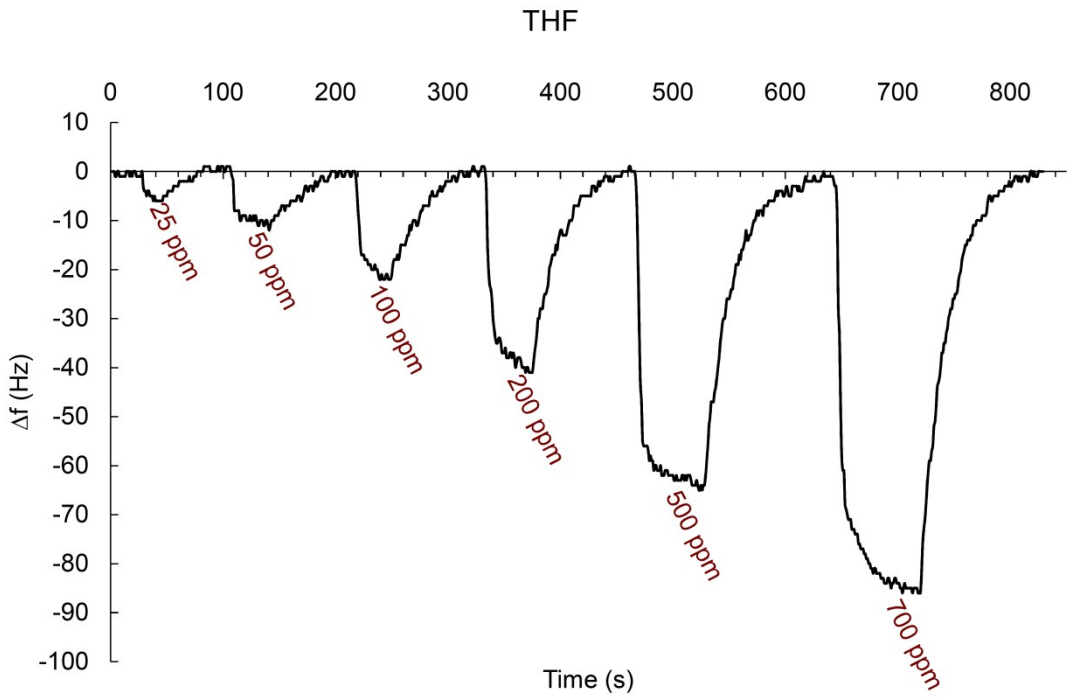

Fig. S7. Real-time sensor responses to THF

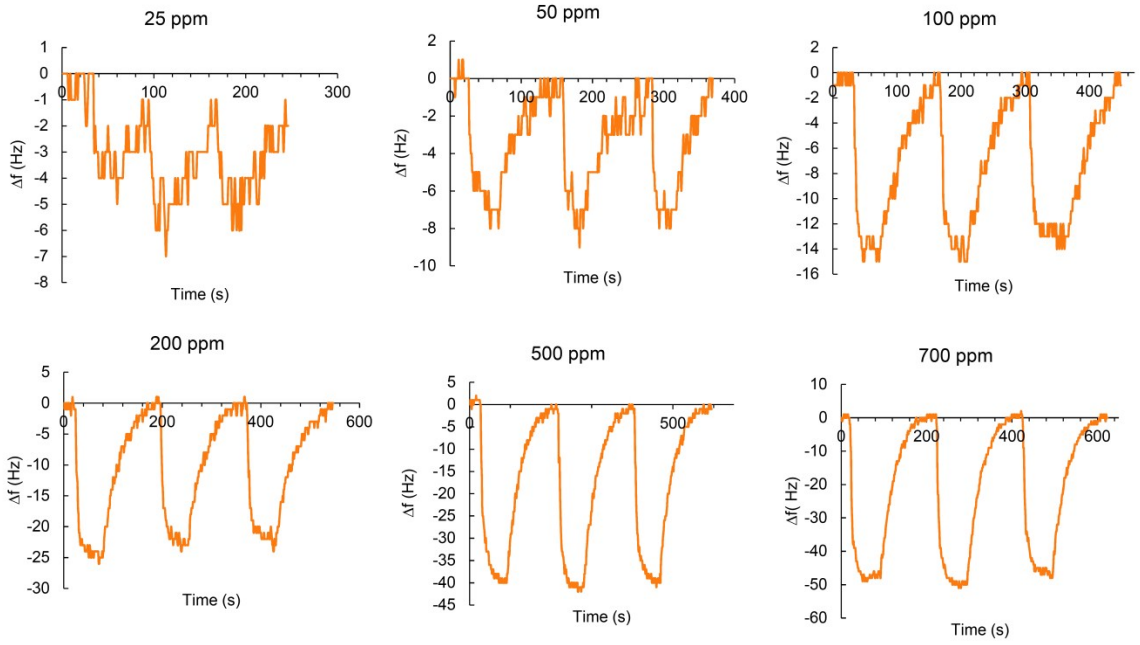

Fig. S8. Reversibility and repeatability of sensor response versus time to acetone

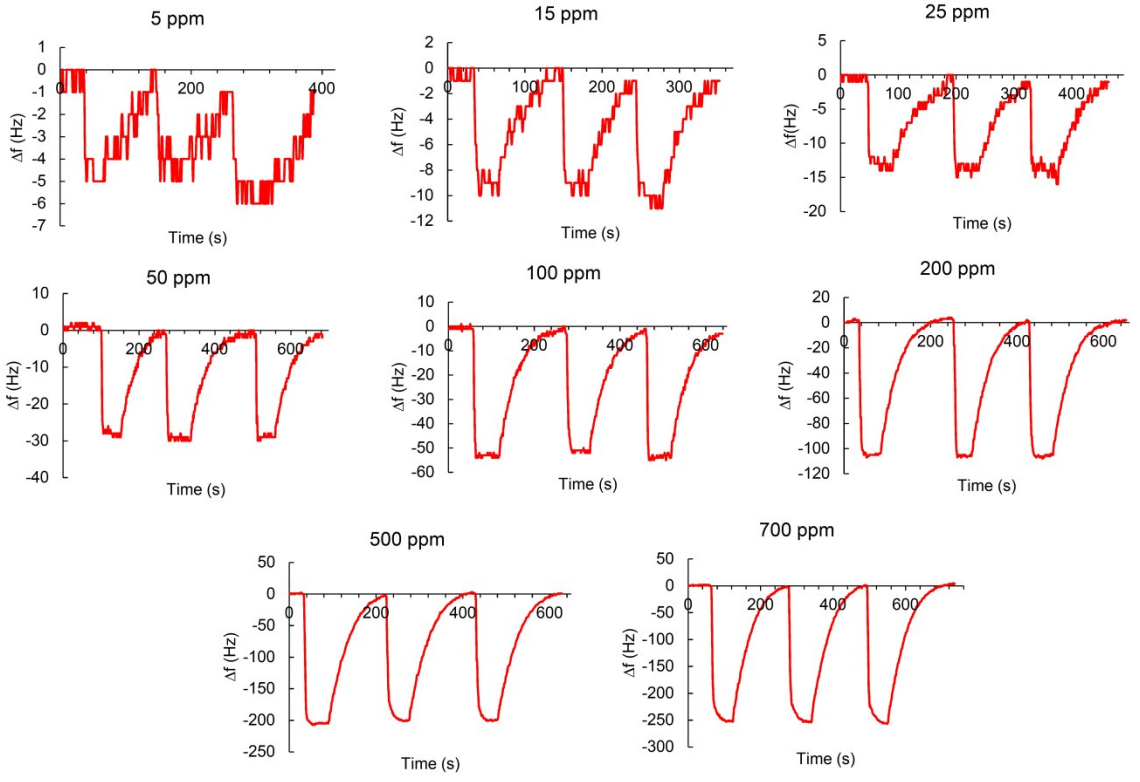

Fig. S9. Reversibility and repeatability of sensor response versus time to chloroform

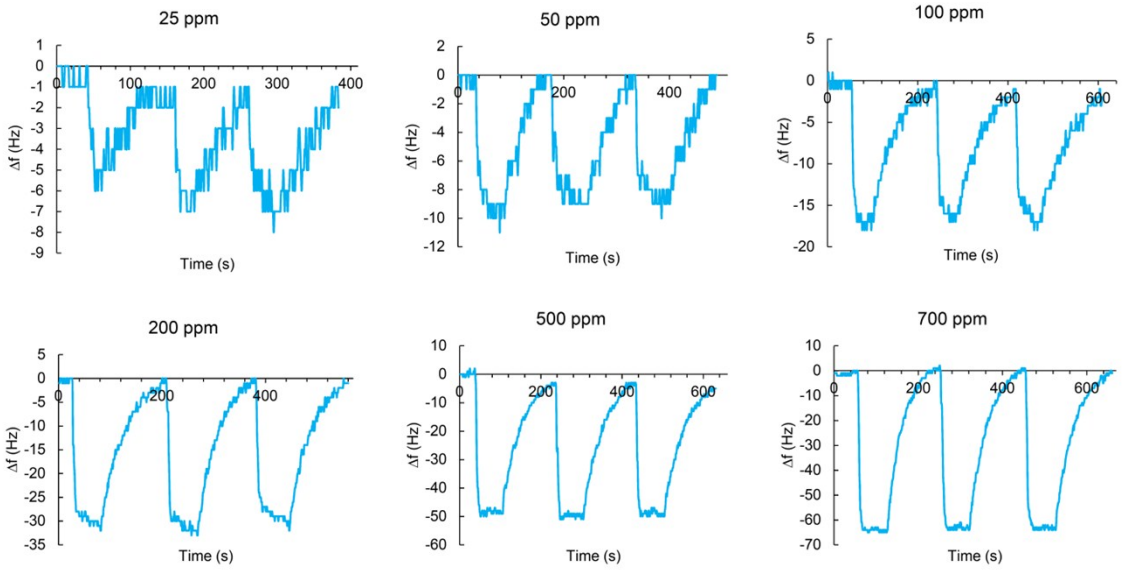

Fig. S10. Reversibility and repeatability of sensor response versus time to dichloromethane

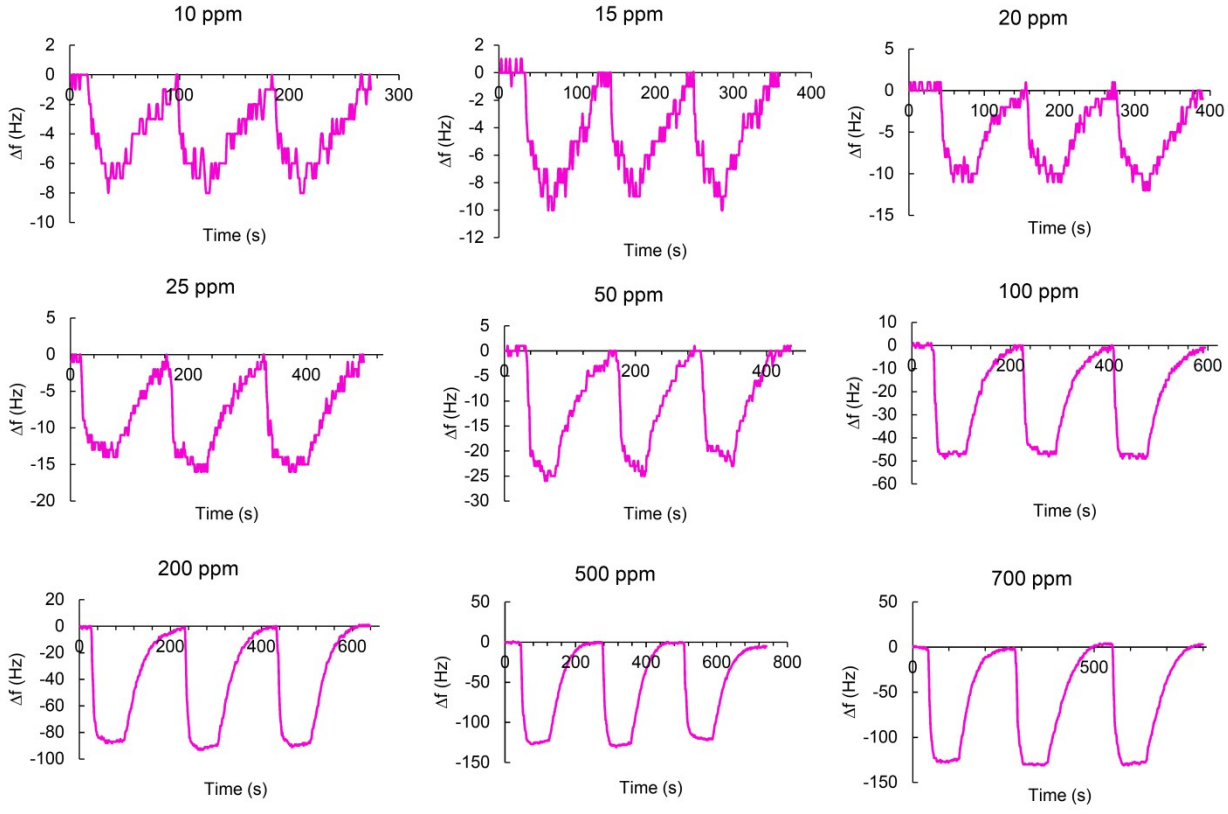

Fig. S11. Reversibility and repeatability of sensor response versus time to ethanol

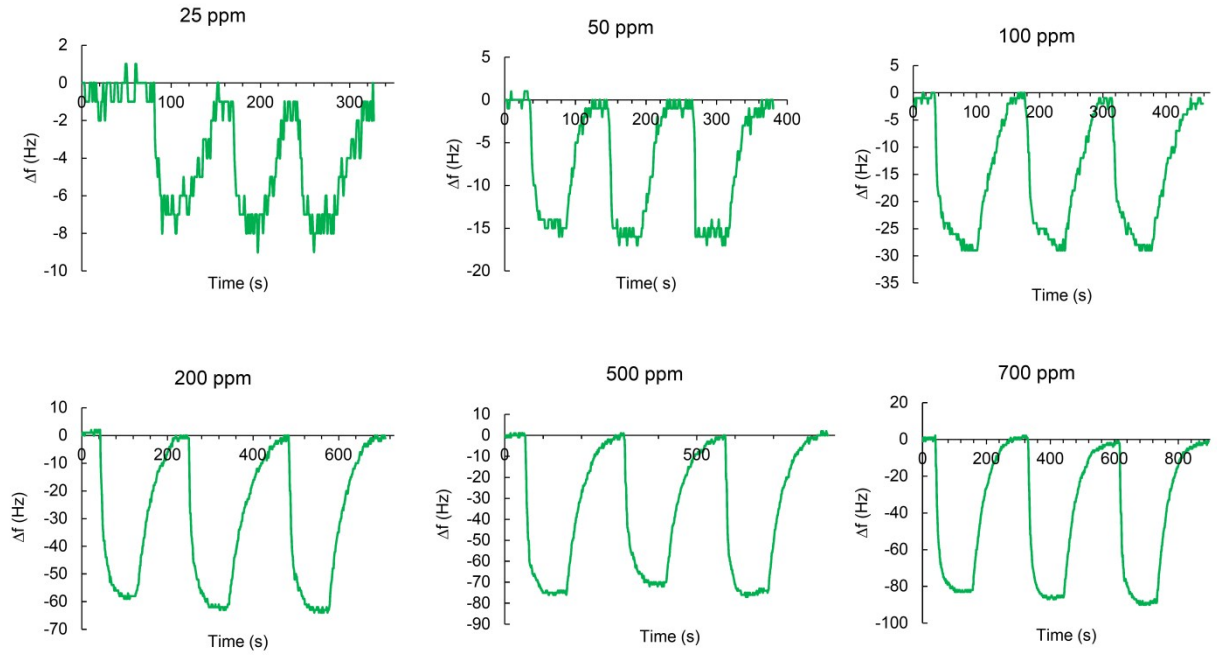

Fig. S12. Reversibility and repeatability of sensor response versus time to methanol

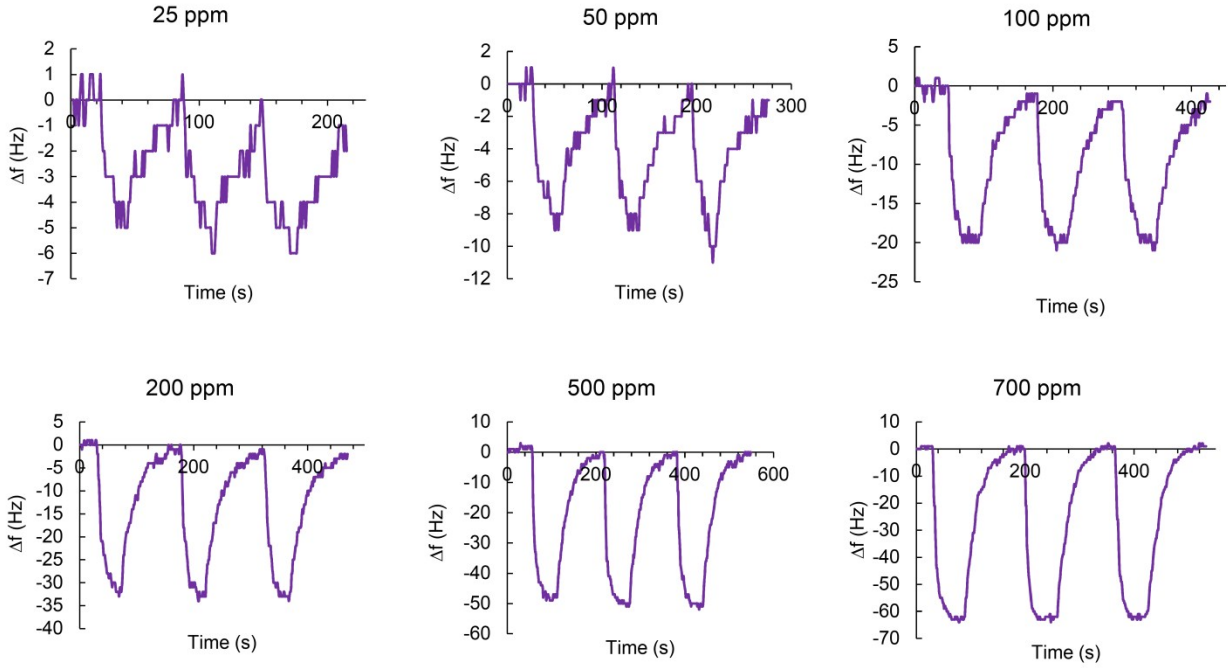

Fig. S13. Reversibility and repeatability of sensor response versus time to n-hexane

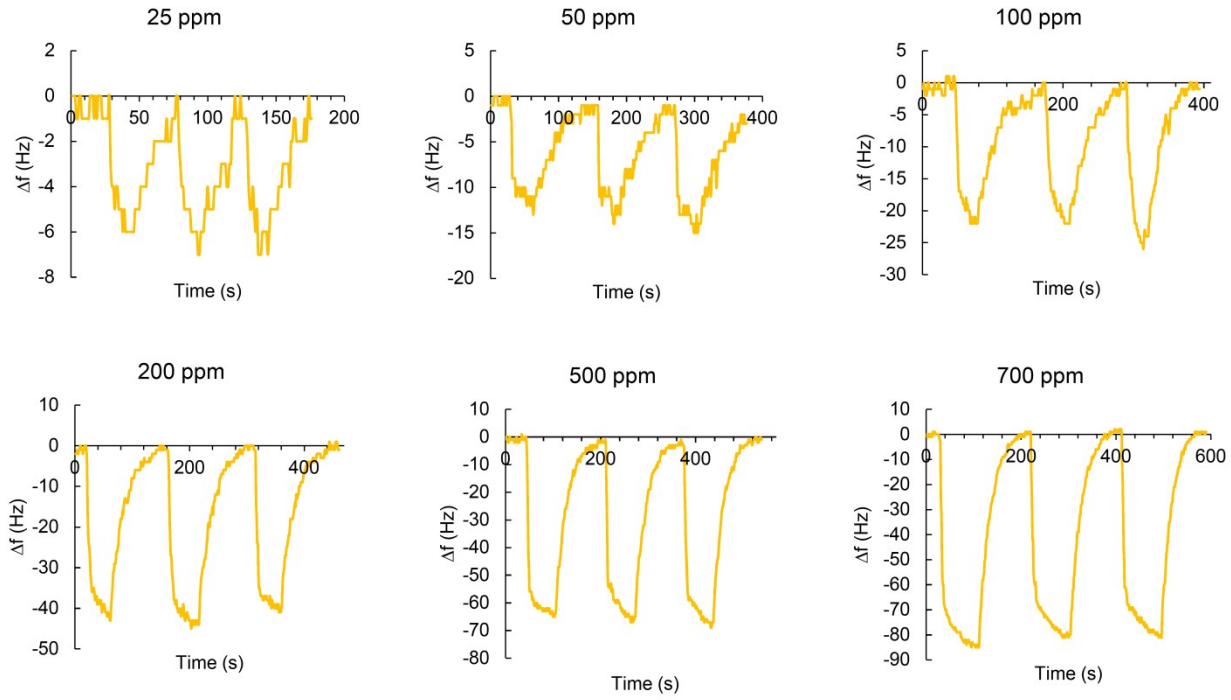

Fig. S14. Reversibility and repeatability of sensor response versus time to THF

Table S1. Sensor mean response and response/recovery time with standard deviation to different analytes in different concentration ranges of 3 adsorption/desorption cycles

Analyte	Concentration (ppm)	ΔF (Hz)	Response time (s)	Recovery time (s)
Methanol	25.00	7.00 ± 0.00	7.67 ± 0.58	20.33 ± 0.58
	50.00	15.67 ± 0.58	7.67 ± 3.06	22.67± 0.58
	100.00	28.67 ± 0.58	23.67 ± 1.15	45.33 ± 1.53
	200.00	61.33 ± 1.53	23.33 ± 0.58	79.67 ± 13.32
	500.00	73.67 ± 3.21	25.67 ± 3.79	83.33 ± 4.16
	700.00	85.33 ± 1.15	24.00 ± 1.00	79.00 ± 6.56
Ethanol	10.00	7.00 ± 0.00	10.00 ± 3.00	38.33 ± 0.58
	15.00	9.00 ± 0.00	12.00 ± 2.00	43.00 ± 6.24
	20.00	12.00 ± 1.00	14.00 ± 1.00	46.67 ± 0.58
	25.00	14.33 ± 0.58	14.67 ± 1.53	54.33 ± 1.15
	50.00	24.00 ± 2.00	13.33 ± 2.08	55.33 ± 5.13
	100.00	46.33 ± 1.15	14.33 ± 0.58	70.67 ± 2.89
	200.00	87.67 ± 1.53	15.00 ± 1.00	71.00 ± 5.00
	500.00	122.67 ± 3.06	15.67 ± 0.58	73.67 ± 5.86
	700.00	122.67 ± 3.06	16.67 ± 0.58	87.67 ± 16.20
2-Propanol	5.00	4.67 ± 0.58	7.00 ± 1.73	29.67 ± 10.41
	10.00	8.00 ± 0.00	7.67 ± 0.58	37.33 ± 3.06
	15.00	11.67 ± 0.58	7.67 ± 0.58	43.33 ± 5.86
	20.00	14.33 ± 0.58	7.33 ± 1.15	53.67 ± 1.53
	25.00	17.67 ± 0.58	8.33 ± 0.58	55.00 ± 2.00

	50.00	33.00 ± 0.00	9.33 ± 0.58	56.00 ± 5.20
	100.00	66.00 ± 2.00	9.00 ± 0.00	57.00 ± 1.00
	200.00	95.67 ± 1.53	10.00 ± 1.00	60.33 ± 6.11
	500.00	117.33 ± 1.15	11.00 ± 1.73	81.67 ± 9.87
	700.00	142.33 ± 1.15	13.33 ± 1.15	86.00 ± 1.73
Acetone	25.00	4.00 ± 0.00	6.33 ± 0.58	25.33 ± 5.86
	50.00	7.00 ± 0.00	6.33 ± 1.15	37.00 ± 2.65
	100.00	12.67 ± 0.58	10.00 ± 3.61	57.00 ± 6.56
	200.00	23.33 ± 0.58	13.67 ± 3.51	64.00 ± 1.00
	500.00	40.00 ± 1.00	18.67 ± 4.73	64.67 ± 1.15
	700.00	49.33 ± 1.53	19.67 ± 3.21	66.67 ± 2.52
Dichloromethane	25.00	5.33 ± 0.58	8.00 ± 1.00	30.33 ± 9.02
	50.00	9.33 ± 0.58	9.00 ± 1.00	54.67 ± 3.06
	100.00	16.33 ± 0.58	9.67 ± 2.52	74.67 ± 9.07
	200.00	31.67 ± 1.15	11.00 ± 0.00	78.67 ± 8.39
	500.00	48.67 ± 2.08	11.33 ± 1.15	84.33 ± 2.52
	700.00	64.00 ± 1.00	12.33 ± 0.58	84.67 ± 2.08
Chloroform	5.00	4.00 ± 0.00	3.67 ± 0.58	42.33 ± 3.21
	15.00	9.33 ± 0.58	3.67 ± 0.58	47.67 ± 5.51
	25.00	14.33 ± 0.58	5.67 ± 0.58	65.67 ± 7.77
	50.00	28.33 ± 0.58	6.33 ± 0.58	70.67 ± 7.02
	100.00	52.67 ± 0.58	8.00 ± 1.00	80.67 ± 2.08
	200.00	106.00 ± 0.00	9.00 ± 0.00	81.67 ± 2.08
	500.00	202.00 ± 2.65	9.67 ± 0.58	86.67 ± 4.04
	700.00	251.67 ± 1.53	10.33 ± 0.58	93.33 ± 4.16
n-Hexane	25.00	5.00 ± 0.00	11.00 ± 1.00	24.67 ± 8.14
	50.00	9.67 ± 0.58	13.67 ± 0.58	42.67 ± 9.45
	100.00	18.67 ± 0.58	16.33 ± 5.77	48.67 ± 2.31
	200.00	33.00 ± 0.00	20.33 ± 2.89	49.67 ± 2.52
	500.00	50.67 ± 0.58	21.33 ± 3.21	52.00 ± 0.00
	700.00	61.67 ± 1.53	20.00 ± 0.00	48.67 ± 1.15
THF	25.00	6.00 ± 0.00	5.67 ± 1.53	21.00 ± 3.00
	50.00	12.33 ± 0.58	14.67 ± 0.58	45.33 ± 1.53
	100.00	23.00 ± 1.00	16.00 ± 1.00	47.67 ± 8.08
	200.00	41.33 ± 1.53	17.33 ± 2.08	48.33 ± 3.51
	500.00	64.00 ± 0.00	18.67 ± 0.58	50.00 ± 2.65
	700.00	82.33 ± 1.15	27.67 ± 4.04	54.00 ± 3.46
Pyridine	5.00	17.00 ± 0.00	7.67 ± 0.58	61.00 ± 5.29
	10.00	32.00 ± 0.00	7.67 ± 0.58	75.67 ± 3.21
	15.00	45.33 ± 1.53	8.00 ± 1.73	79.67 ± 1.53
	20.00	58.00 ± 1.00	8.00 ± 1.00	79.33 ± 2.08
	25.00	73.00 ± 2.00	9.00 ± 1.00	84.00 ± 7.94
	50.00	141.33 ± 1.53	10.33 ± 0.58	102.00 ± 1.73
	100.00	163.00 ± 3.61	13.67 ± 2.89	107.00 ± 2.65
	200.00	187.67 ± 2.31	14.67 ± 3.06	108.67 ± 6.66
	500.00	292.33 ± 2.89	19.00 ± 1.00	108.33 ± 0.58
	700.00	357.00 ± 7.21	23.67 ± 2.89	117.33 ± 1.15

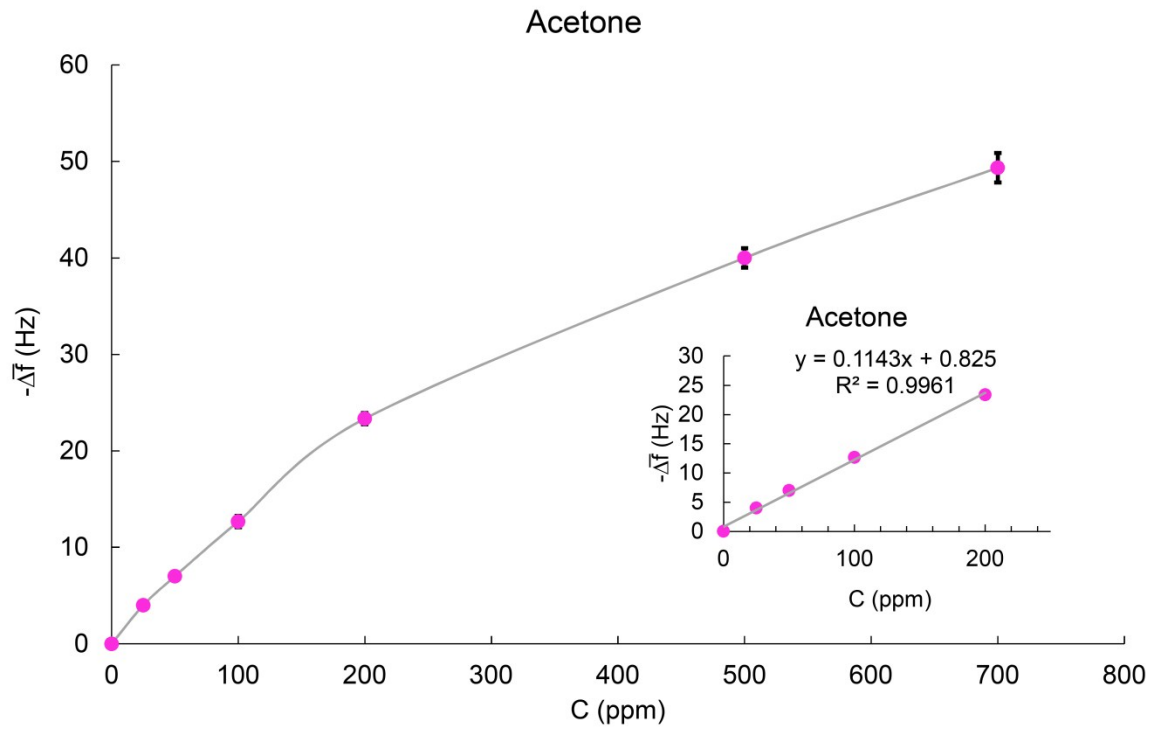

Fig. S15. Calibration curves of sensor to acetone

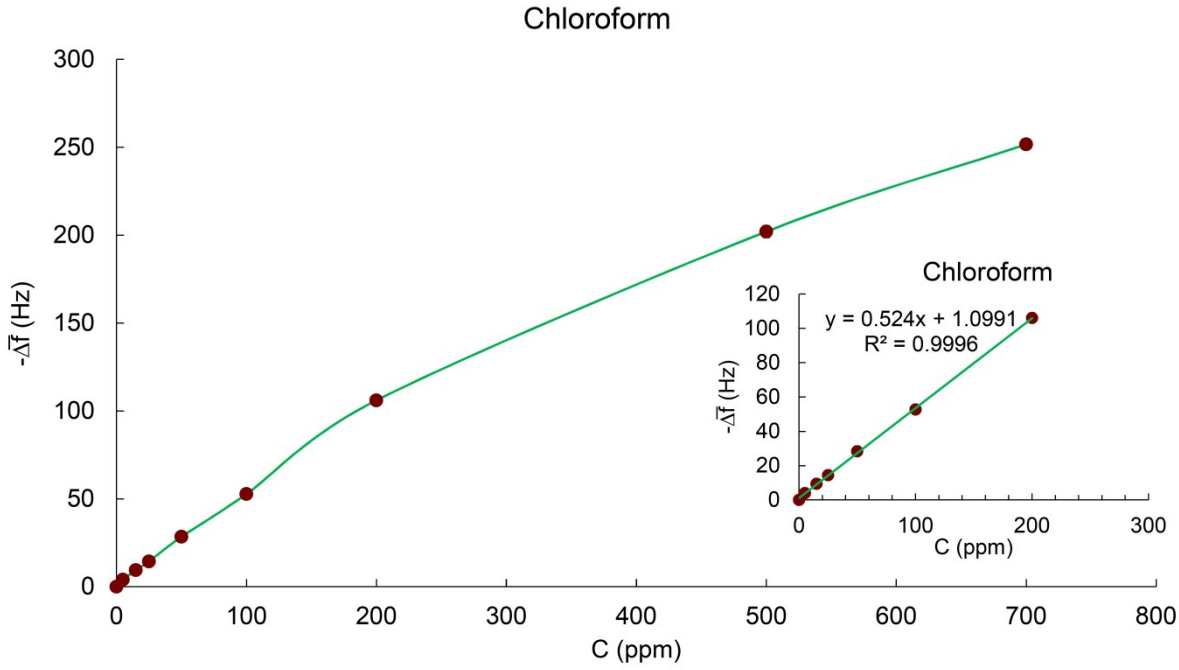

Fig. S16. Calibration curves of sensor to chloroform

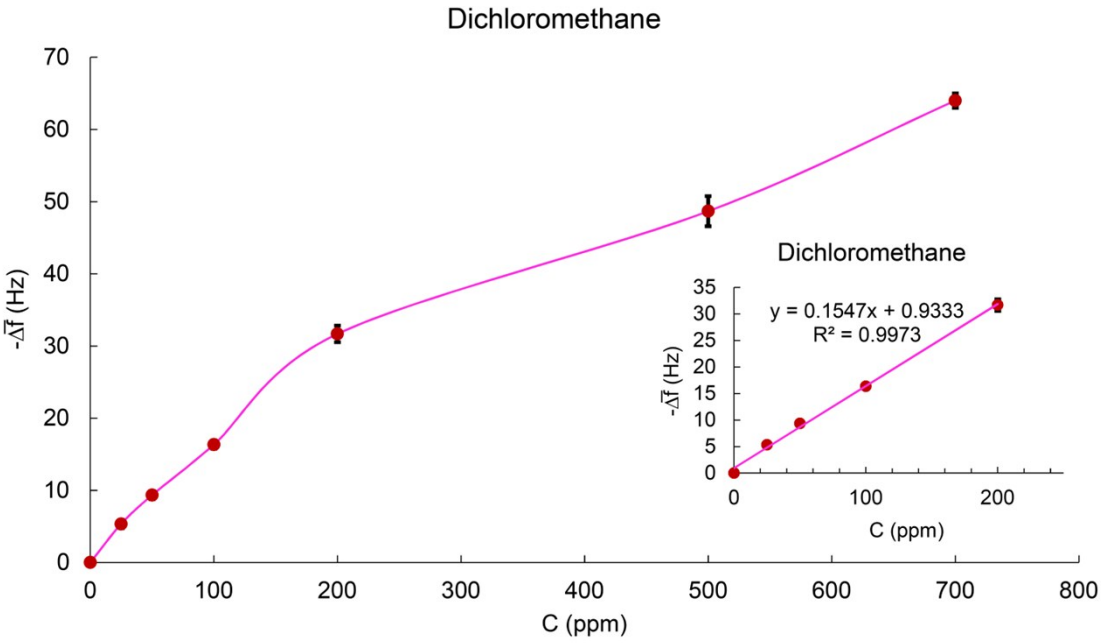

Fig. S17. Calibration curves of sensor to dichloromethane

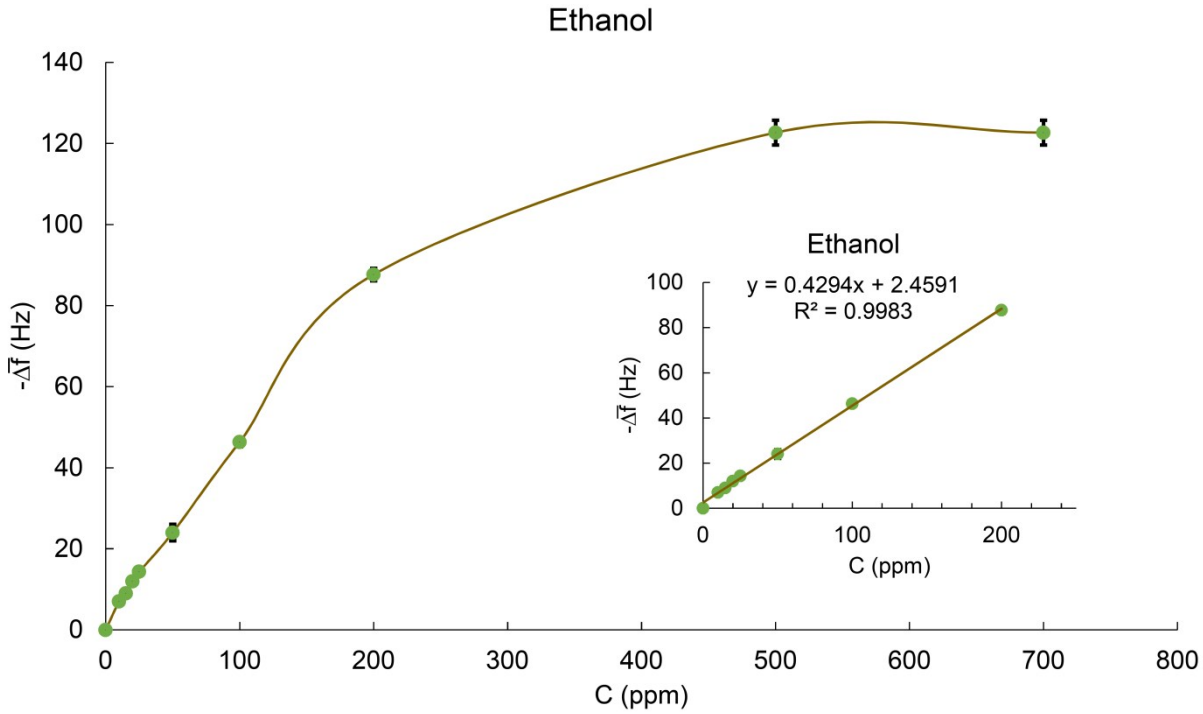

Fig. S18. Calibration curves of sensor to ethanol

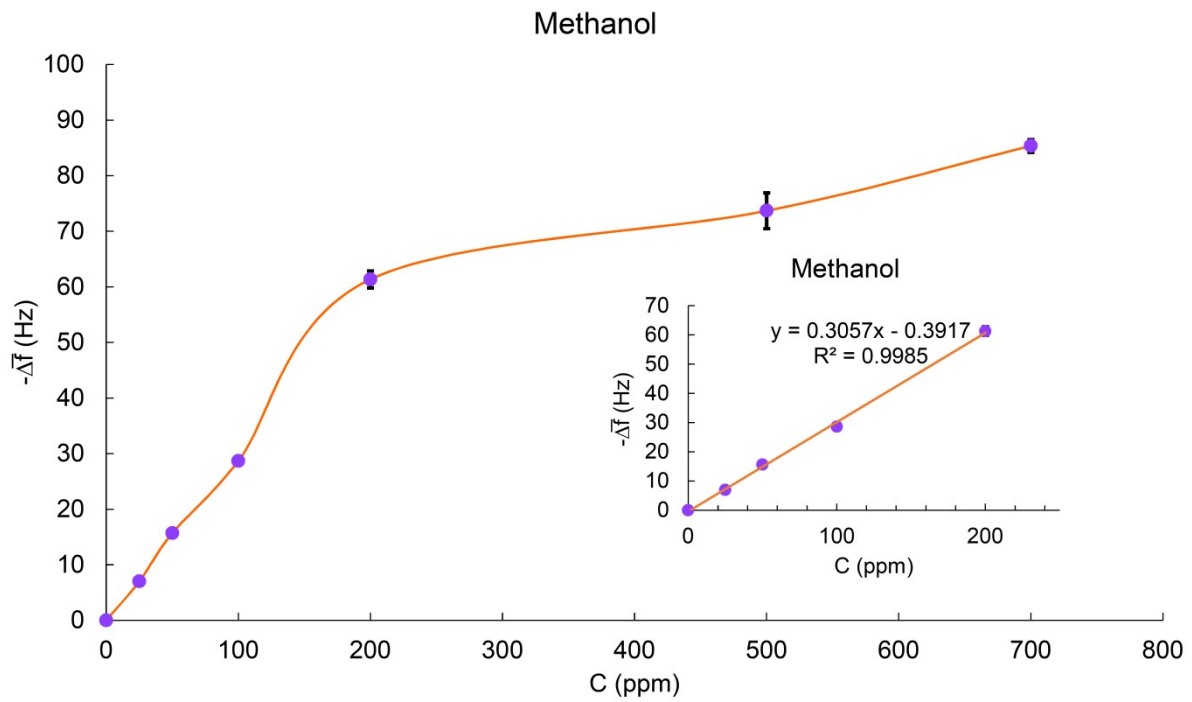

Fig. S19. Calibration curves of sensor to methanol

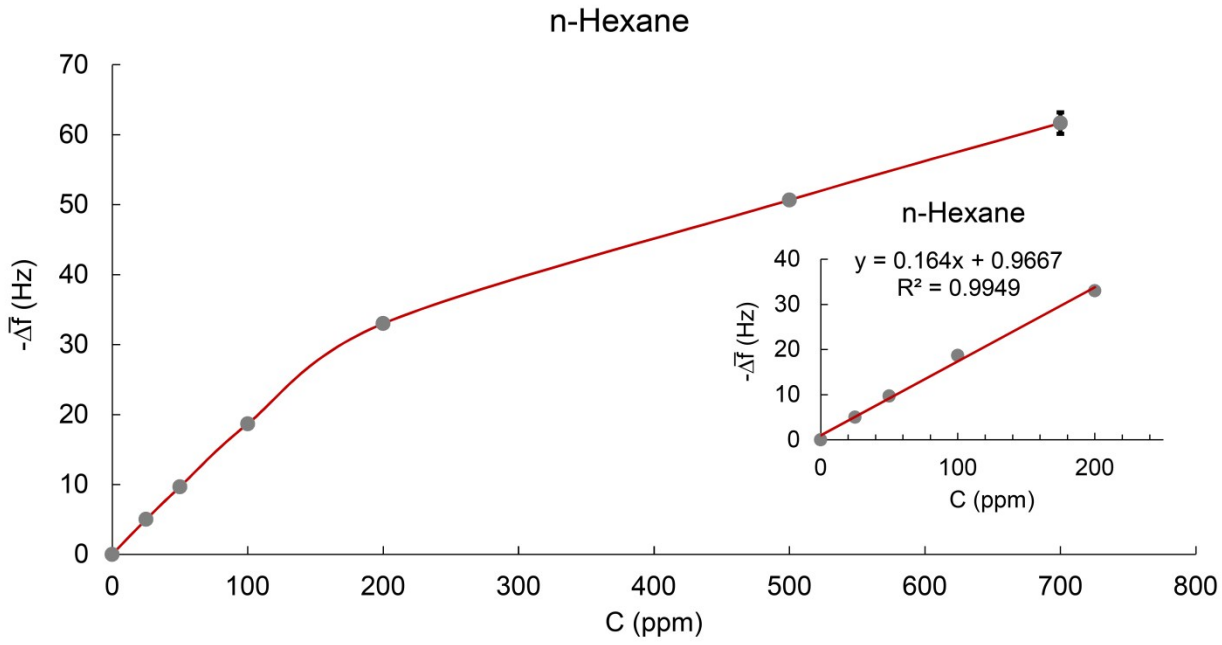

Fig. S20. Calibration curves of sensor to n-hexane

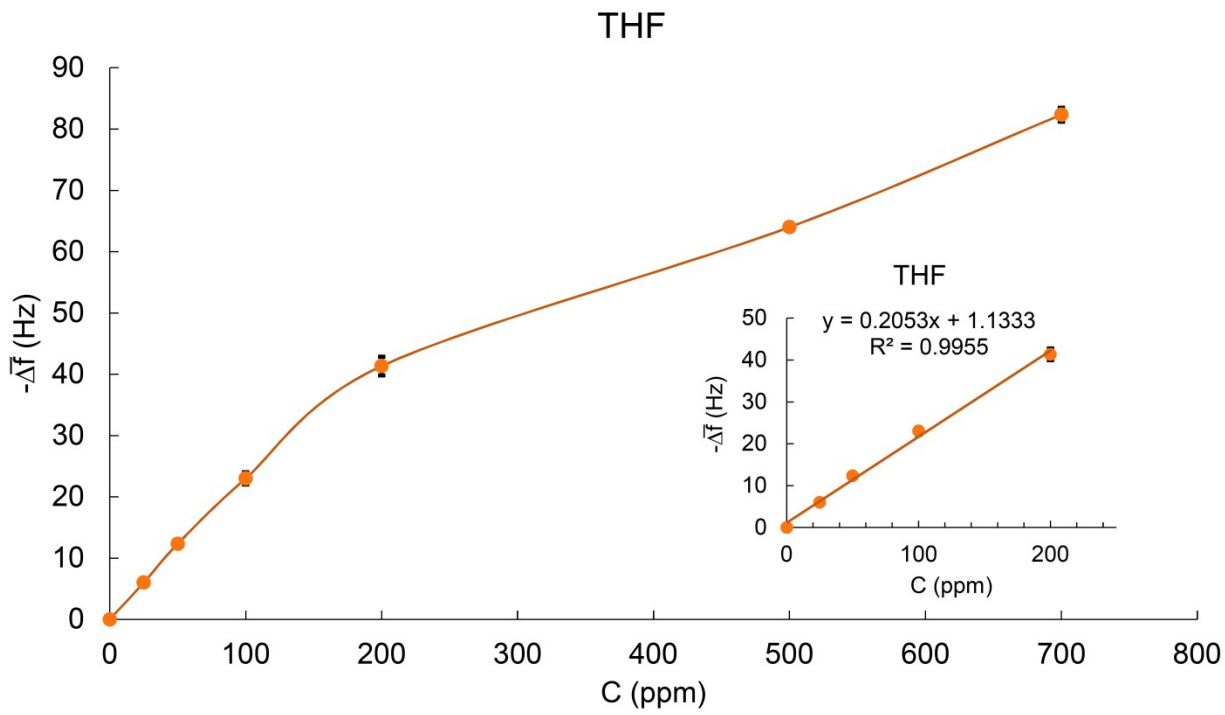

Fig. S21. Calibration curves of sensor to THF