Supporting Information

Fc@ZeNose Platform for the Detection of Four Physiologically Relevant Breath Biomarkers: A Case Study Using Ethanol, Isopropanol, Acetic Acid, and Acetone.

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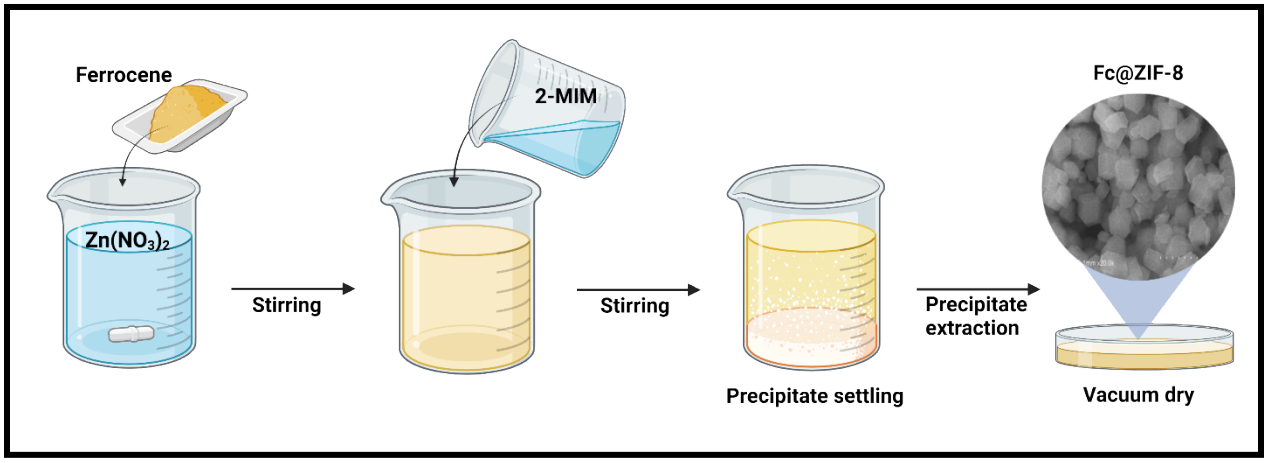

Figure S1: Schematic representation of the synthesis process of Fc@ZIF-8.

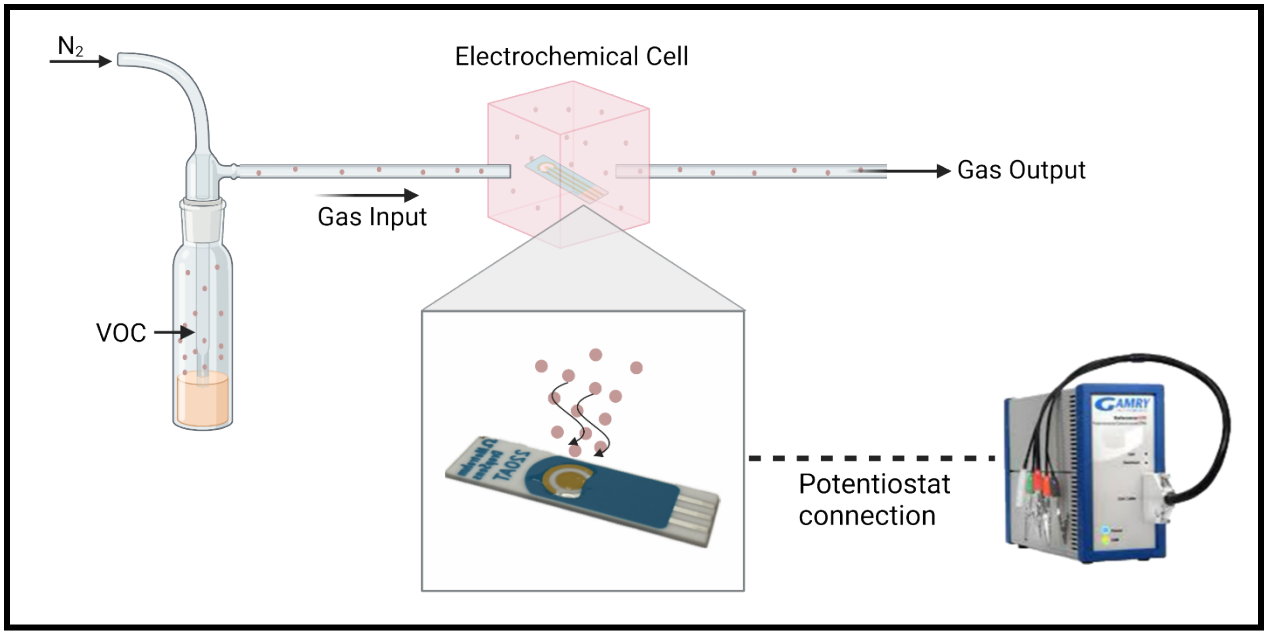

Figure S2: Schematic representation of experimental setup for conducting experiments.

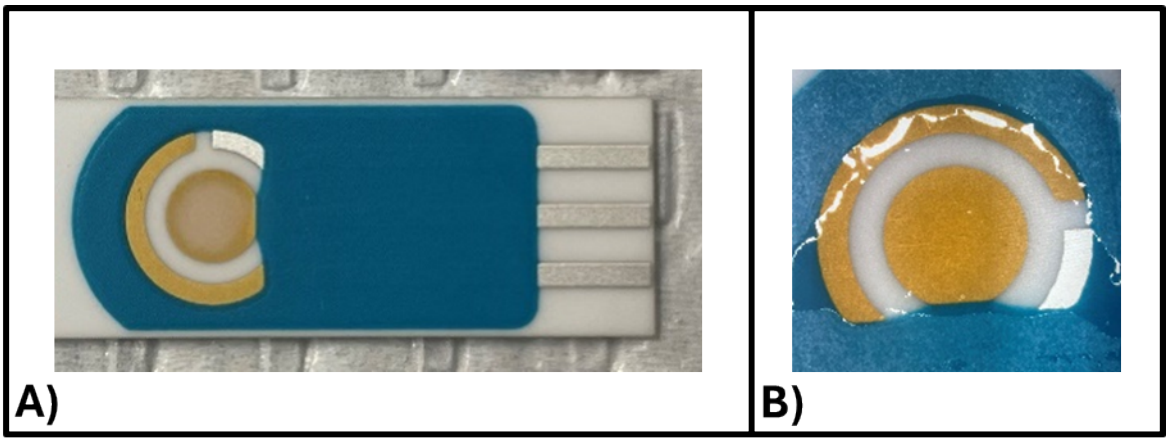

Figure S3: A) Working electrode modified with synthesized Fc@ZIF-8. B) Modification of the electrodes system with RTIL, [BMIM][BF4] via spin coating.

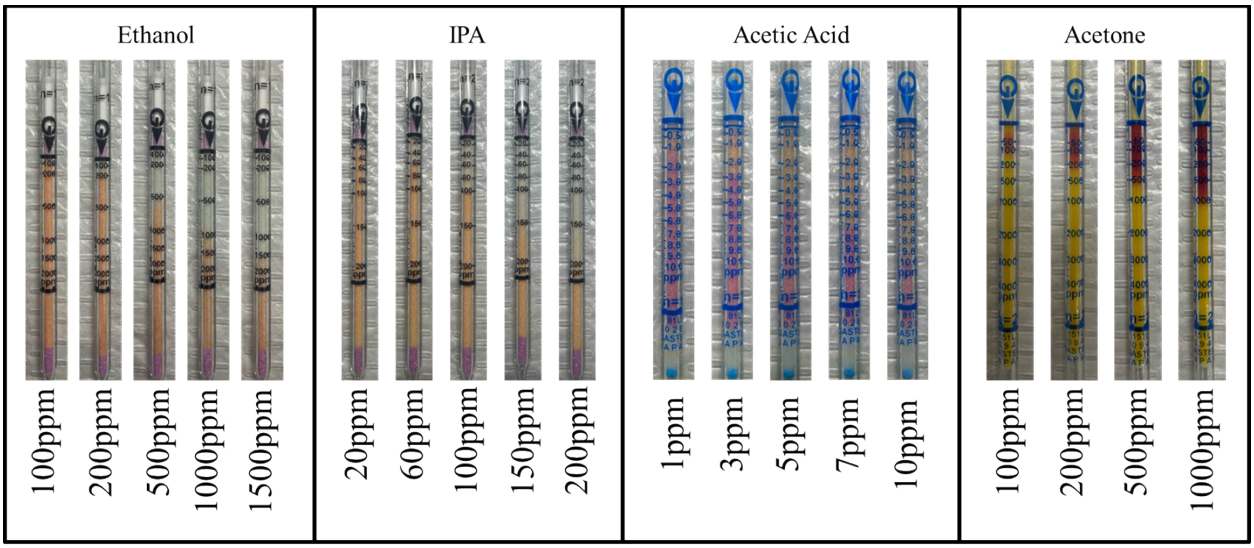

Figure S4: VOC concentration validation with GasTec validation tubes

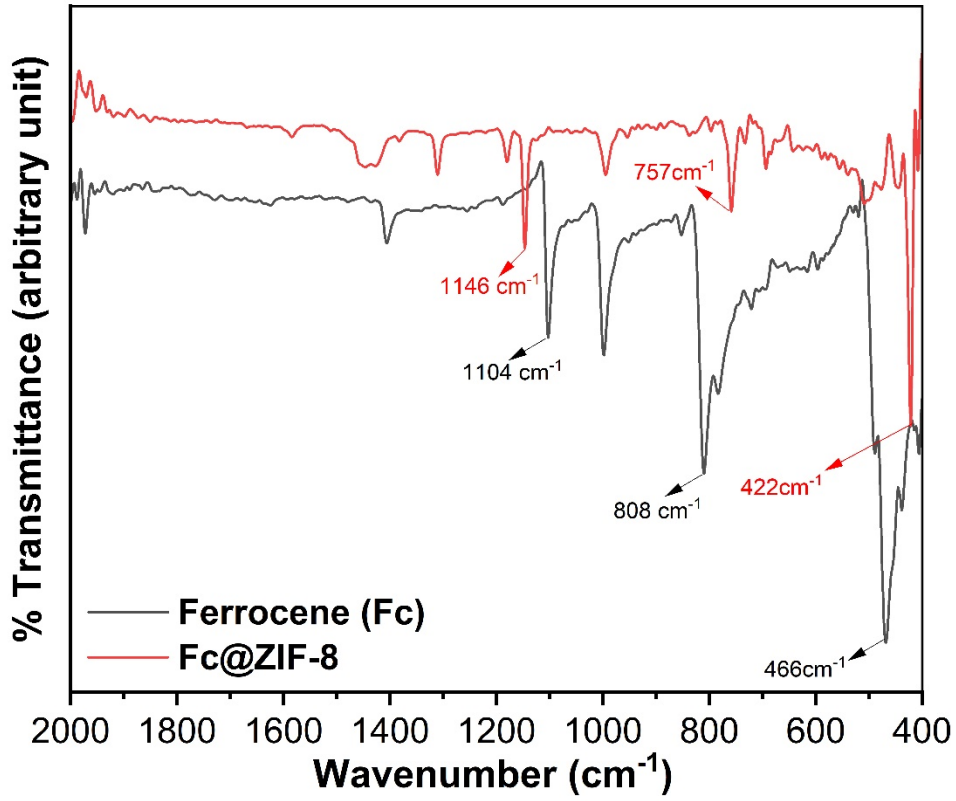

Figure S5: FT-IR spectroscopy of pristine Ferrocen (Fc) and Fc@ZIF-8

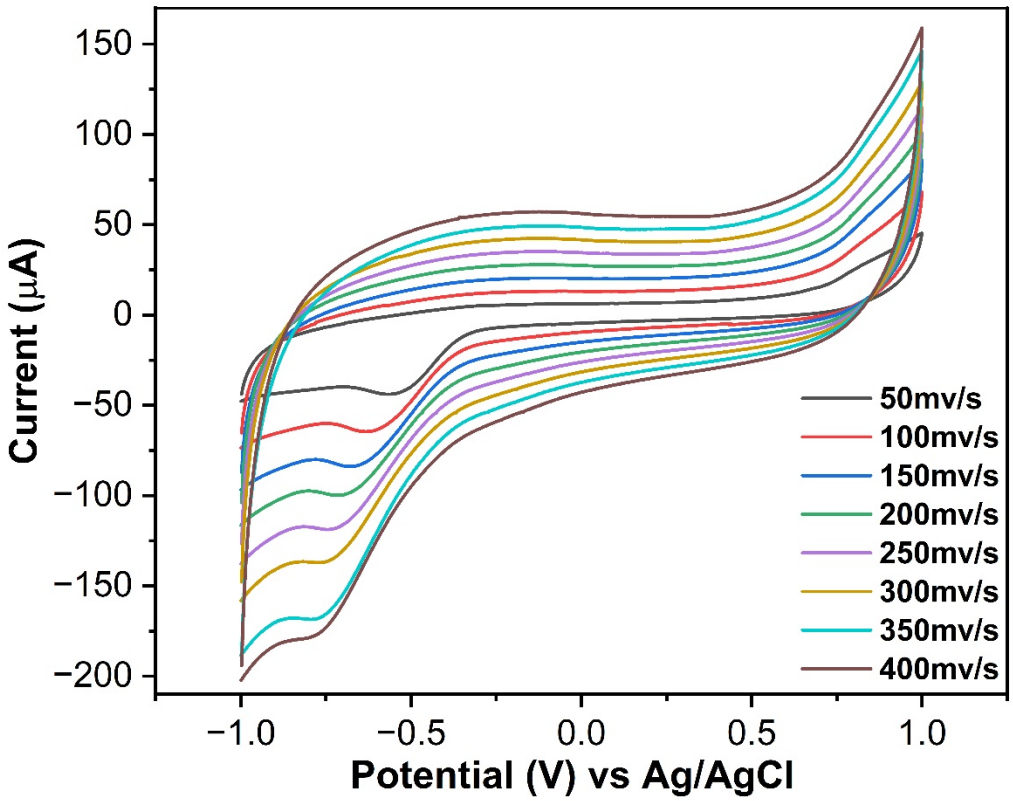

Figure S6: Cyclic voltammetry scan rate variation using Fc@ZIF-8

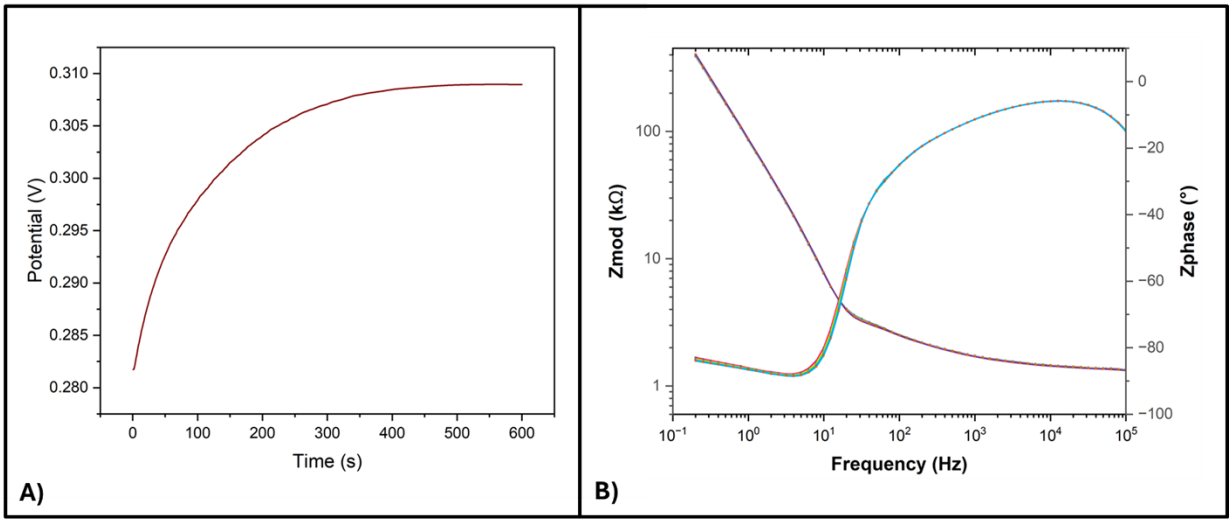

Figure S7: A) Open circuit potential (OCP) showing sensor stabilization approximately around 350s, indicating electrochemical stability over time. B) Bode plot showing minimal variance indicating high sensor stability and reproducibility (N=15).

	Fitting model	1Hz	5Hz	10Hz	20Hz	40Hz
Ethanol	Linear regression	0.95297	0.95706	0.99941	0.85358	0.94154
IPA	Linear regression	0.98261	0.99843	0.96595	0.93177	0.2112
Acetic Acid	Linear regression	0.99647	0.99981	0.98007	0.9082	0.99677
Acetone	Linear regression	0.95349	0.97948	0.83705	0.7452	0.8563

Table S1: Goodness to fit at varying frequencies.

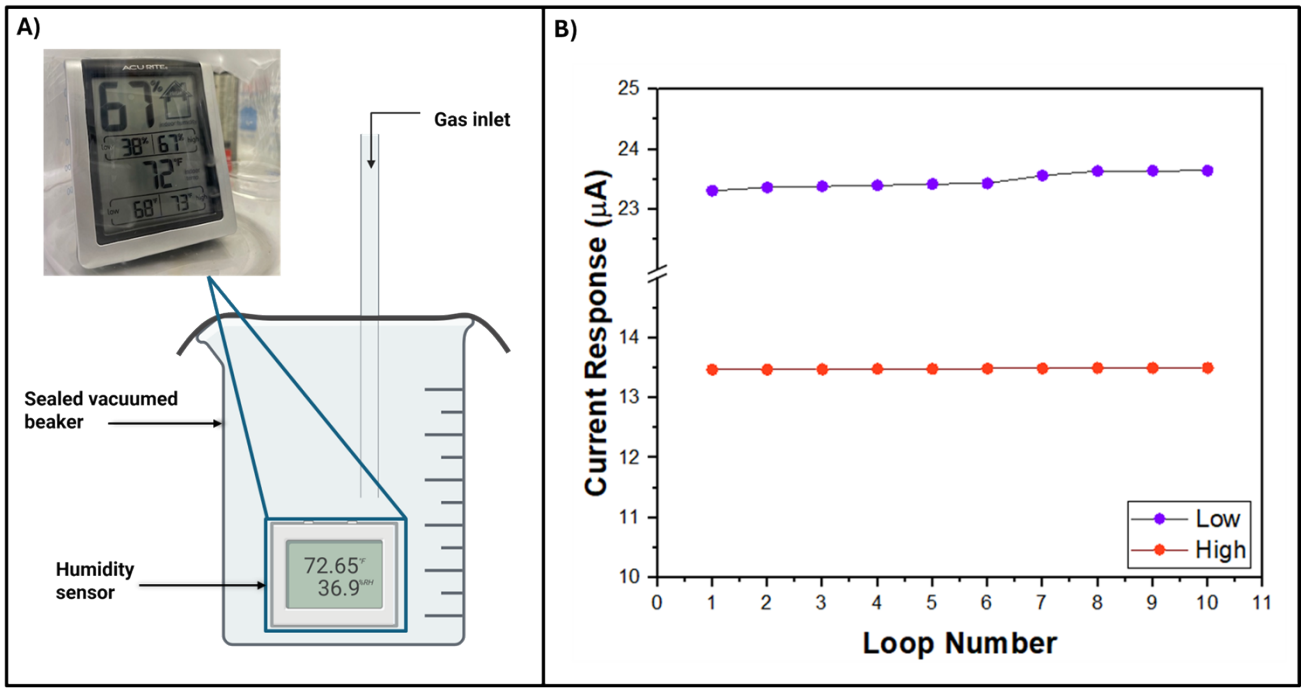

Figure S8: A) Humidity measurement set up for the collected VOC samples from the bubbler output. B) Transient diffusion current response stability over 10 cycles of chronoamperometry plotted for a low and high dose of ethanol as a representative study.

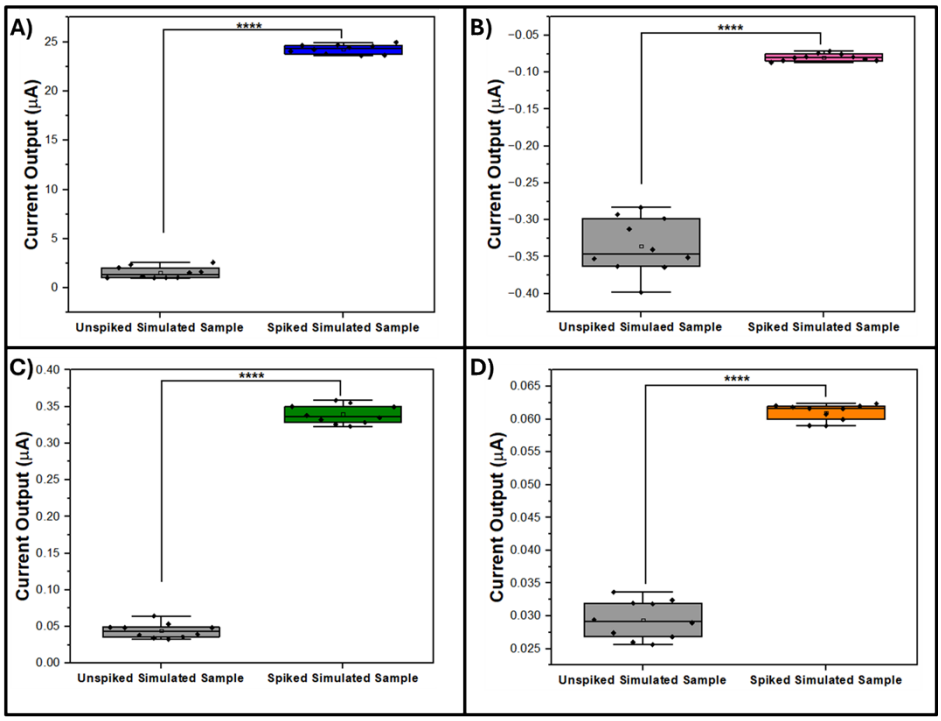

Figure S9: Sensor response with simulated samples. Chronoamperometric current output for the 4 VOCs showing the statistical significance in transient diffusion current between un-spiked and spiked simulated samples. A) Ethanol – spiked with 1000ppm, transient diffusion current extracted at 3s. b) Isopropanol – spiked with 150ppm, transient diffusion current extracted at 5s. c) Acetic Acid – spike with 7ppm, transient diffusion current extracted at 5s. d) Acetone – spiked with 500ppm, transient diffusion current extracted at 2s. (N=10)