Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Z.E.U.S (ZIF-based Electrochemical Ultrasensitive Screening) device for Isopentane Analytics with Focus on Lung Cancer Diagnosis

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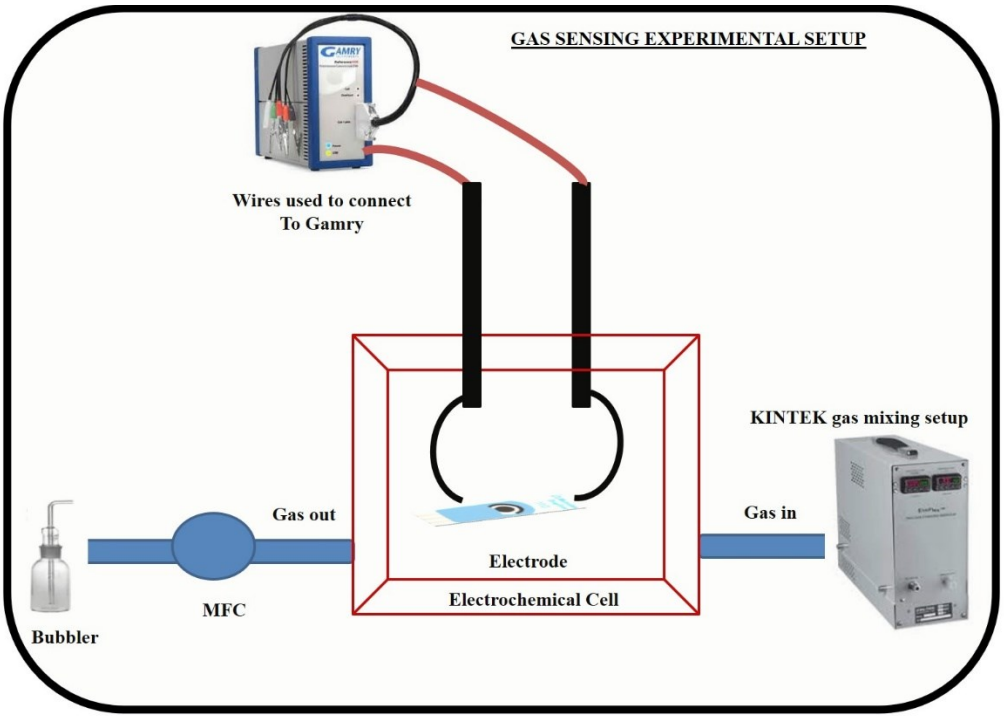


Fig. S1 Schematic representation of the experimental setup used for conducting experiments.

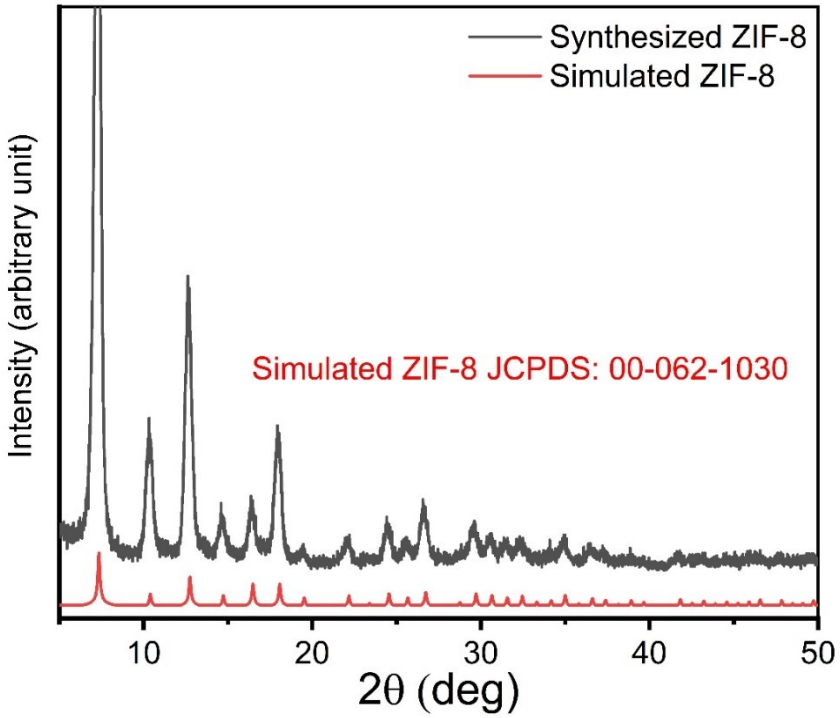
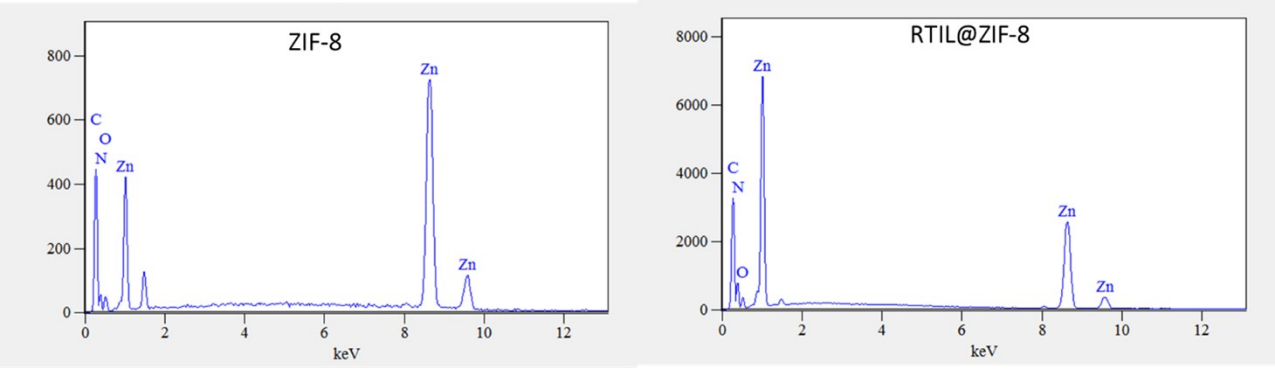


Fig. S2 The standard characteristic peaks of synthesized ZIF-8 is compared with simulated ZIF-8 (JCPDS 00-062-1030; a=b=c=17.0116 Å α=β=γ=90°)



Quantitative Results for: MOF

Element	Net Counts	Int. Cps/nA	ZAF	Weight %	Atom %
C	2578	1.2199	3.8155	21.280	54.452
N	506	0.2394	3.5973	4.263	9.355
O	276	0.1306	2.3912	0.821	1.578
Zn	13484	6.3806	0.9991	73.635	34.615
Total				100.000	100.000

Quantitative Results for: MOF-RTIL

Element	Net Counts	Int. Cps/nA	ZAF	Weight %	Atom %
C	18606	4.2286	3.2633	29.161	57.072
N	6388	1.4518	3.7354	12.407	20.822
O	1282	0.2914	2.7933	0.989	1.453
Zn	45594	10.3623	1.0383	57.443	20.653
Total				100.000	100.000

Fig. S3 EDS spectra and elemental composition of ZIF-8 and RTIL@ZIF-8

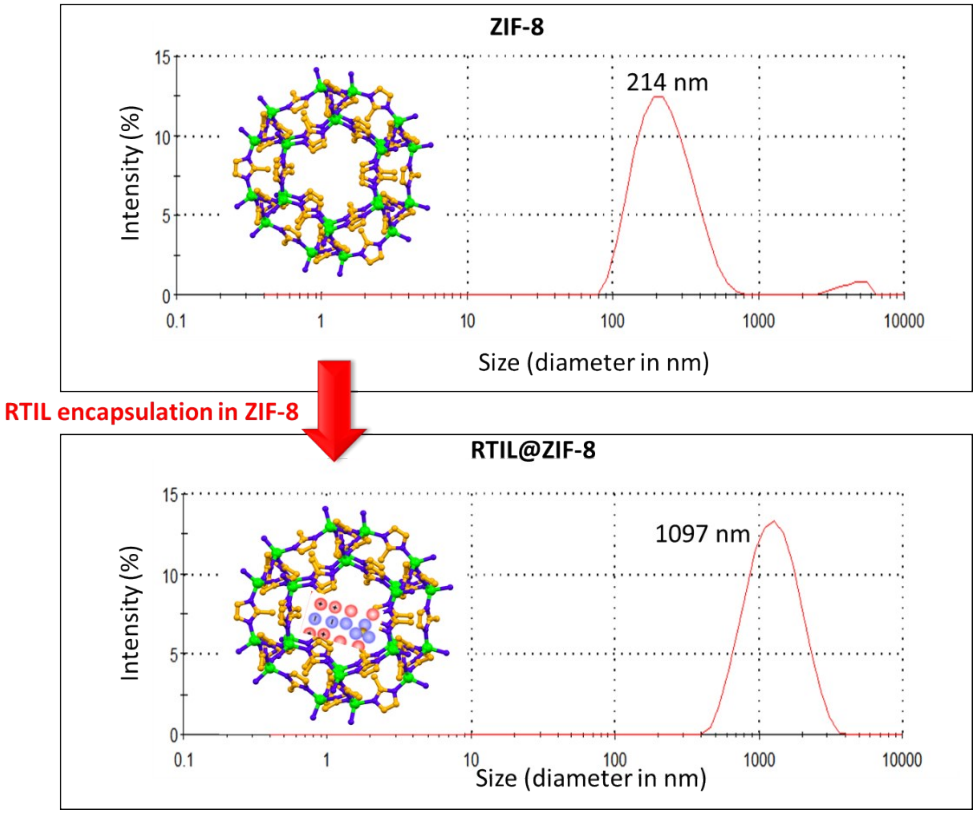


Fig. S4 Size characterization of the synthesized nanocomposite before and after encapsulation of ferrocene.

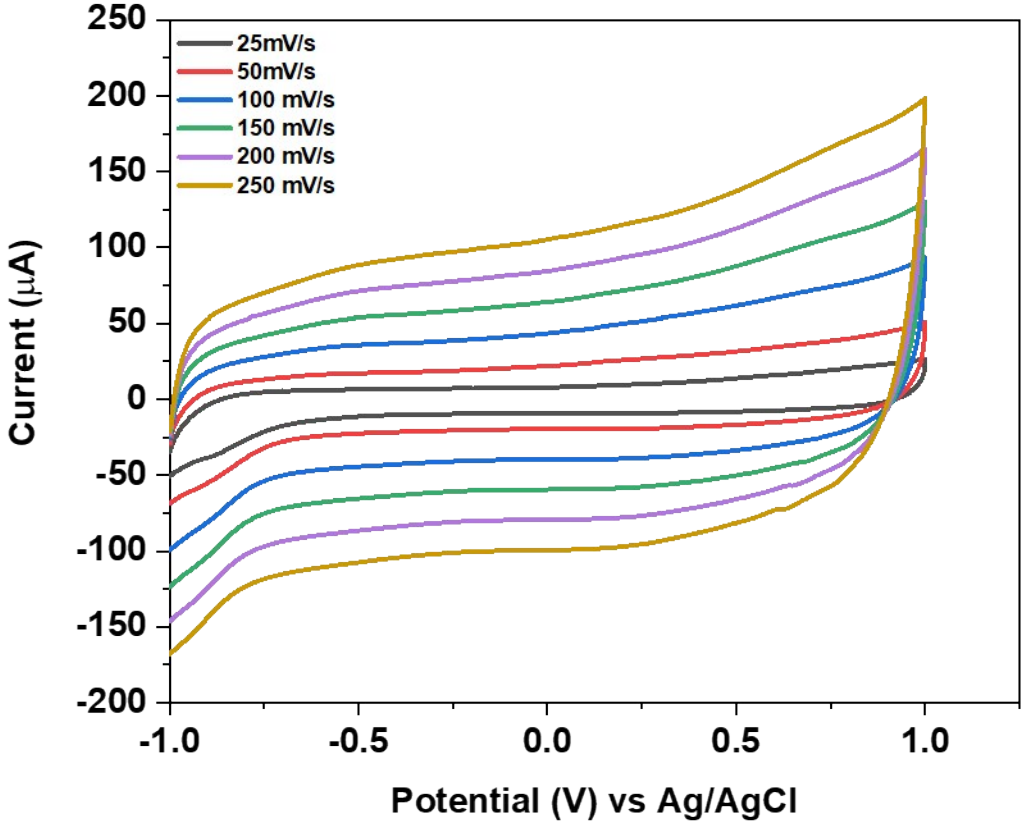


Fig. S5 Cyclic voltammetry (CV) result of modified electrode setup with potential ranging from -1 V to + 1V with increasing scan rate from 25 mV/s to 250 mV/s for detection of isopentane at 600 ppb.

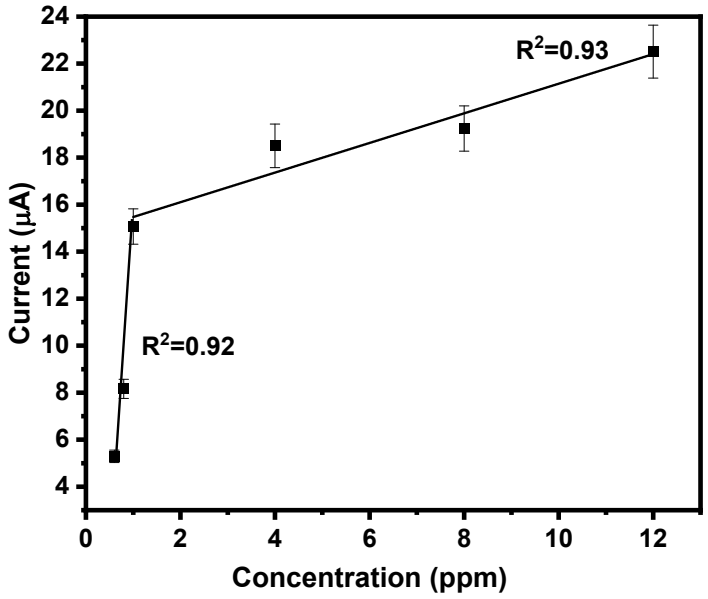


Fig. S6 Linear response fitting of the dose dependent nature of BMIM]BF_4@ZIF-8 modified electrode for sensing isopentane levels ranging from 0.6 to 12 ppm.

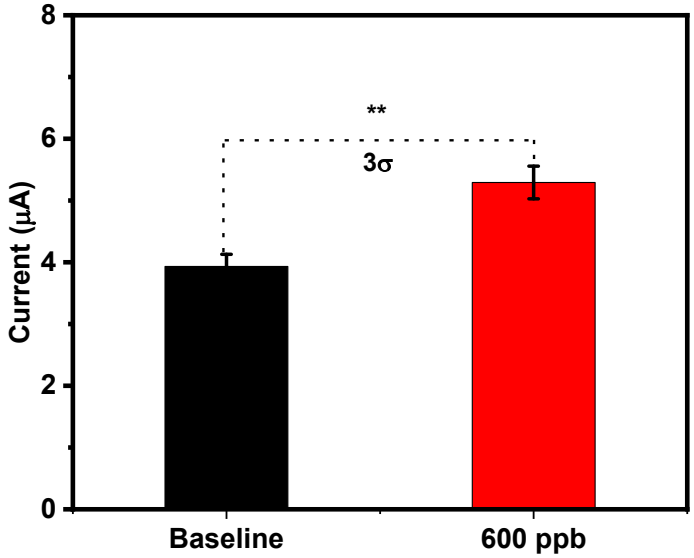


Fig. S7 Limit of detection of 600 ppb has been obtained as the response for target analyte and baseline was 3σ higher

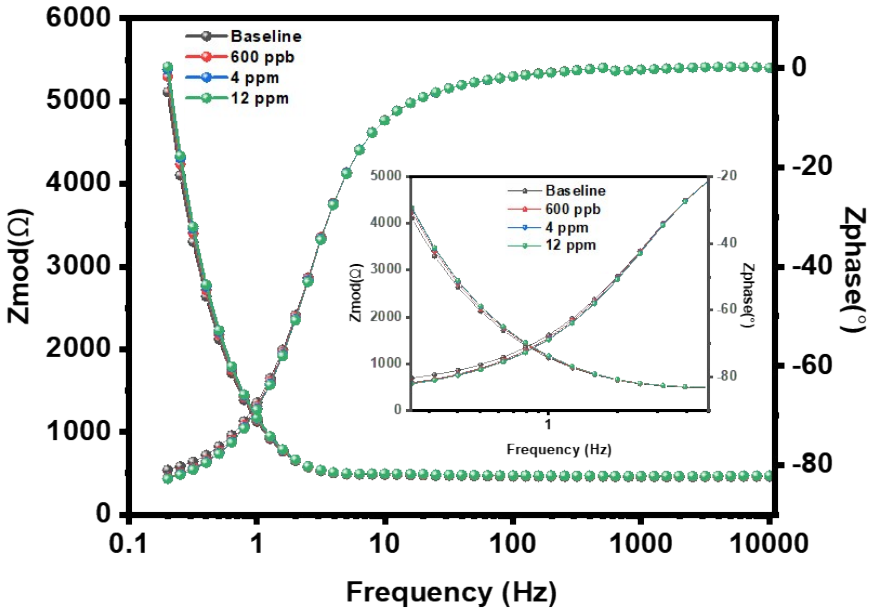


Fig. S8 Bode plots for isopentane detection for low, medium and high concentration.