**Electronic Supplementary Material**

# Amino-thiacalix[4]arene modified screen-printed electrodes as a novel electrochemical interface for Hg(II) quantification at pico-molar level

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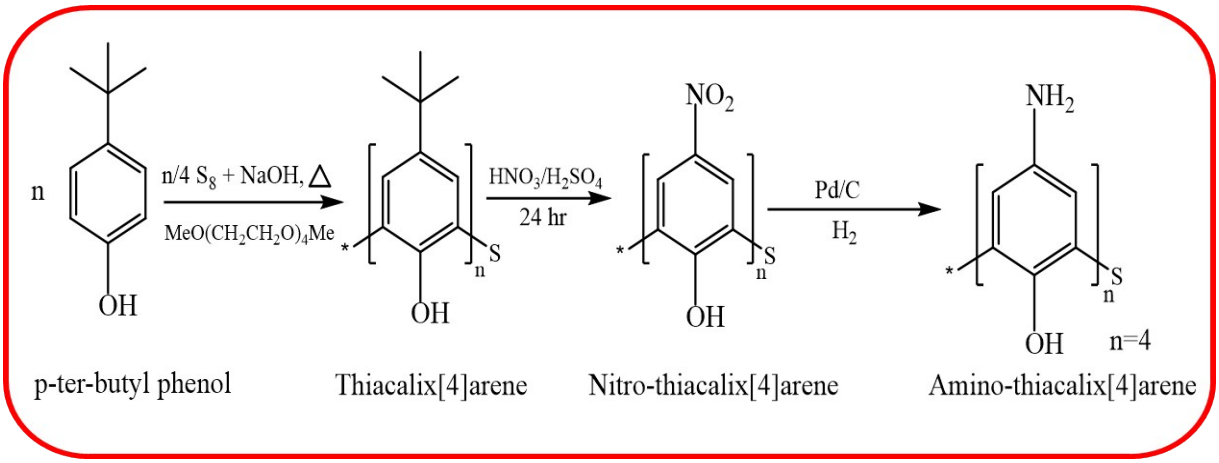


**Scheme S1** Synthesis of amino-thiacalix[4]arene

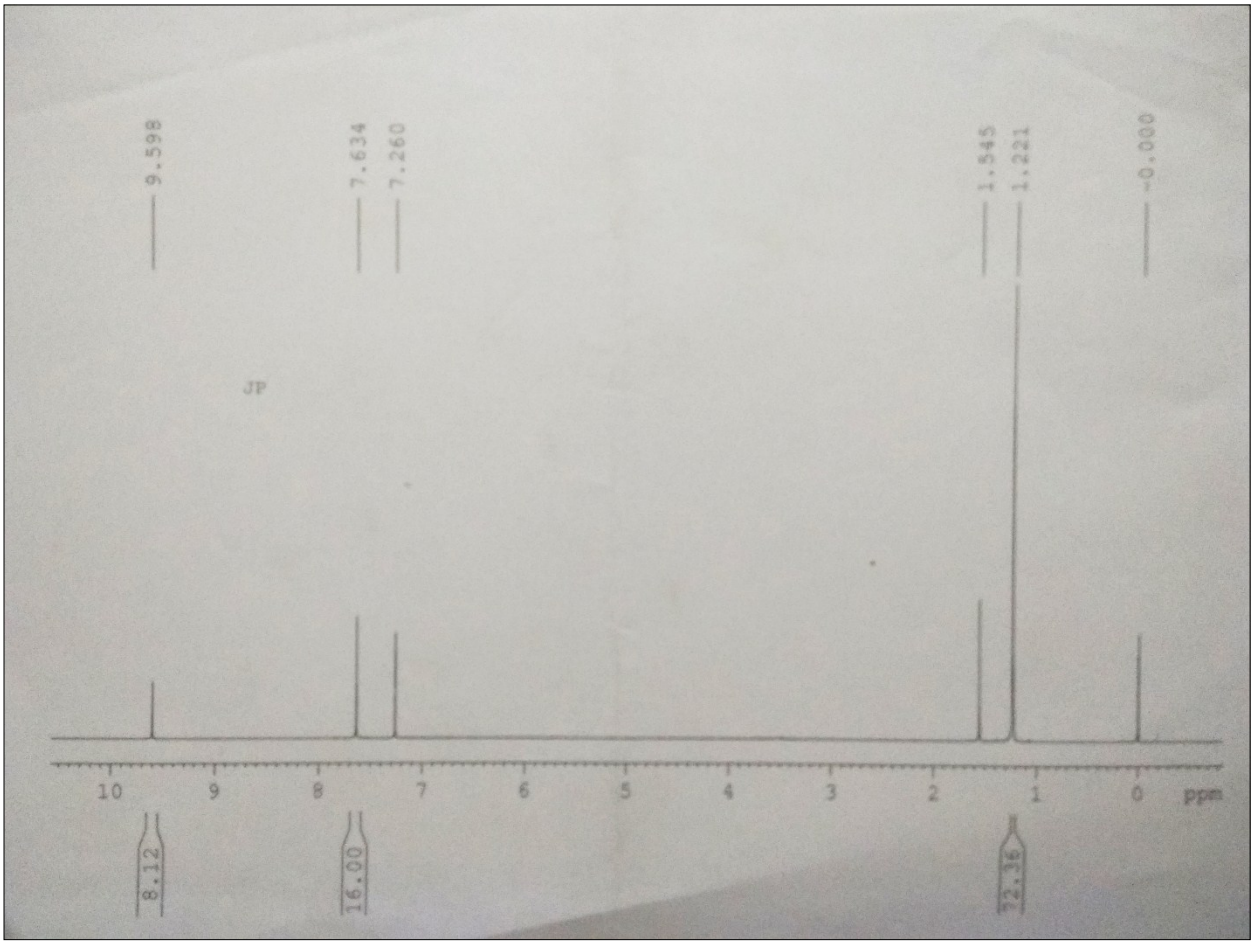


**Fig. S1** $^{1}$H NMR spectrum of thiacalix[4]arene

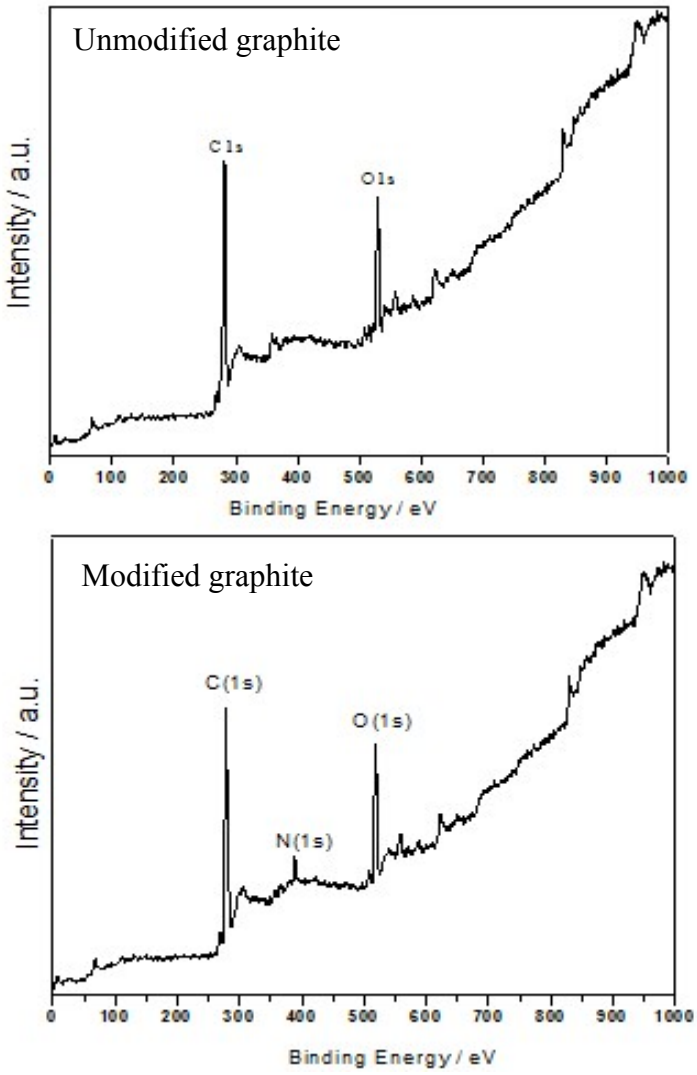


Fig. S1 (b) XPS spectra of unmodified and modified graphitic carbon

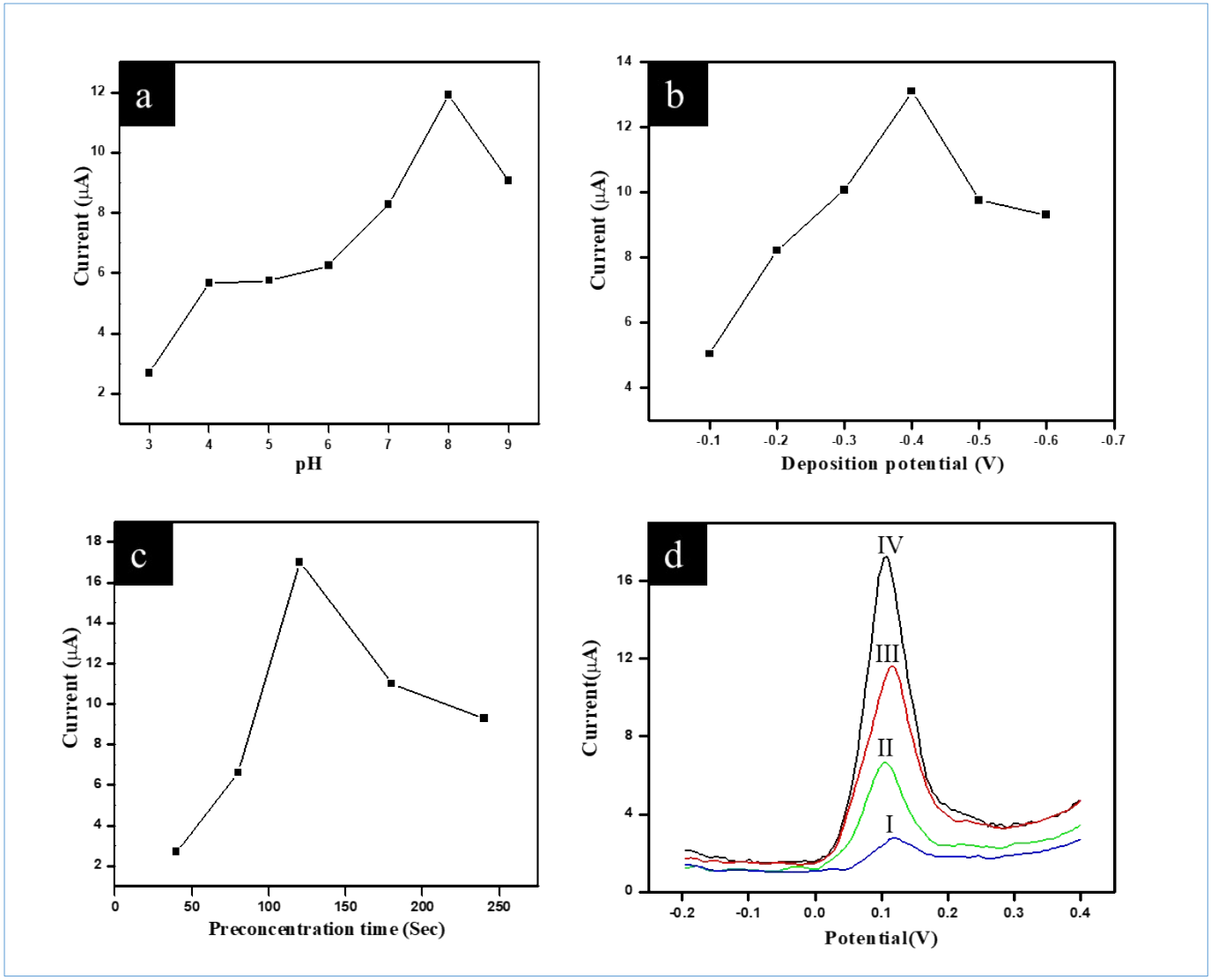


**Fig. S2** Effect of (a) pH, (b) Deposition potential, (c) Preconcentration time and (d) supporting electrolytes (I) $HClO_4^-$, (II) $KNO_3$ (III) KCl and (IV) HCl on the anodic peak current observed for 100 pM concentration of Hg(II) ions.

**Table S1** Interference study

| Interfering ions | Tolerence Limit (μM) |
|---|---|
| $Ag^{+}$, $Fe^{2+}$, $Ni^{2+}$, $Co^{2+,}$ $Cu^{2+}$, $Zn^{2+}$ | 250 |
| $Na^{+}$, $K^{+}$, $Cs^{+}$ | 580 |
| $Co^{2+}$, $Ca^{2+}$, $Mg^{2+}$, $Ba^{2+}$, $Be^{2+}$, $Cr^{3+}$, $Fe^{3+}$, $As^{3+}$, | 450 |
| $C_2O_4^{2-}$, $CO_3^{2-}$, $Cl^{-}$, $F^{-}$, $I^{-}$, $SO_4^{2-}$, $SO_3^{2-}$, $NO_2^{-}$, $NO_3^{-}$, | 410 |

**Table S2** Comparison of proposed sensor with other existing sensors.

| Electrode | Modifier molecule | Technique | Linear Range | Detection limit (LOD) | Reference |
|---|---|---|---|---|---|
| GCE | Thiacalixarene monolayer | DPASV | 0.1 – 20 µg/L | 0.04 µM | 1 |
| CPE | 12-Crown-4-Ether/MWCNTs | LSASV | 25 – 0.55 mM | 1.25 nM | 2 |
| GCE | LB film of calixarene | DPASV | 0.07 – 40 µg/L | 0.04 µM | 3 |
| GCE | Benzothiazole modified calixarene | SWASV | 25 – 300 µg/L | 5 µM | 4 |
| SPE | Gold nanoparticles | SWASV | 5 – 500 nM | 5 nM | 5 |
| SPE | Covalently modified amino-thiacalix[4]arene | DPASV | 2 – 20 pM | 1 pM | Present work |

GCE – glassy carbon electrode, CPE- carbon paste electrode, SPE – Screen-printed electrode

MWCNT – Multi walled carbon nanotube, LB – Langmuir Blodget

DPASV – Differential pulse anodic stripping voltammetry,

LSASV – Linear sweep adsorptive stripping voltammetry

SWASV – Square wave anodic stripping voltammetry

## References


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