

Screen-printed cells CS-4.0

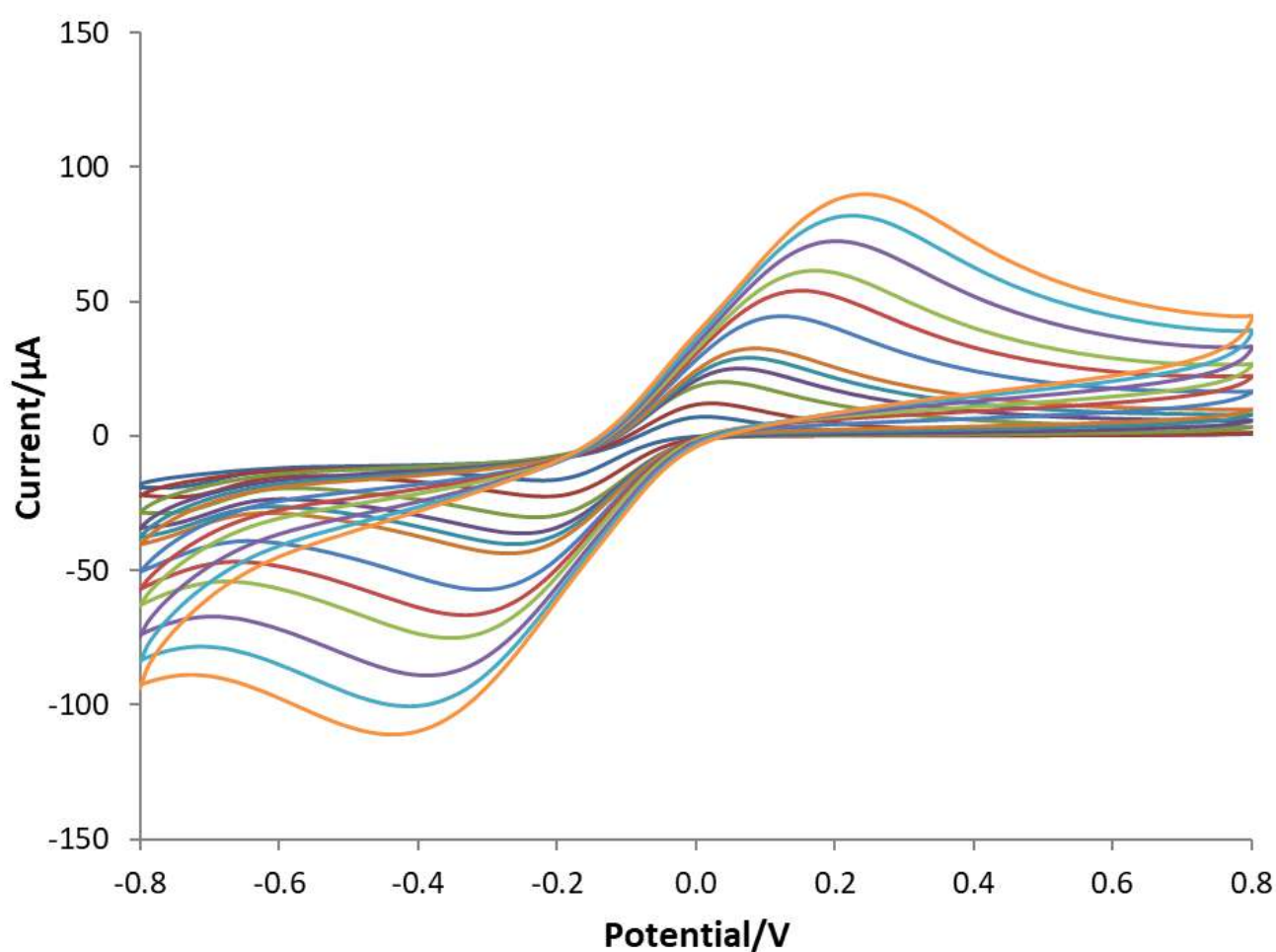
Pretreatment: only rinse with distilled water and stir for 1 min in the probe solution before measurement.

Probe solution: $\text{K}_3\text{Fe}(\text{CN})_6$ 5mM/KCl 0.1M, pH 7

$E_{\text{start}} = -0.8 \text{ V}$; $E_{\text{end}} = +0.8 \text{ V}$

scan rates range: $0.01\text{-}1 \text{ V s}^{-1}$

Active area: $3.47(2) \text{ mm}^2$ (computed by Randles–Sevcik's equation)



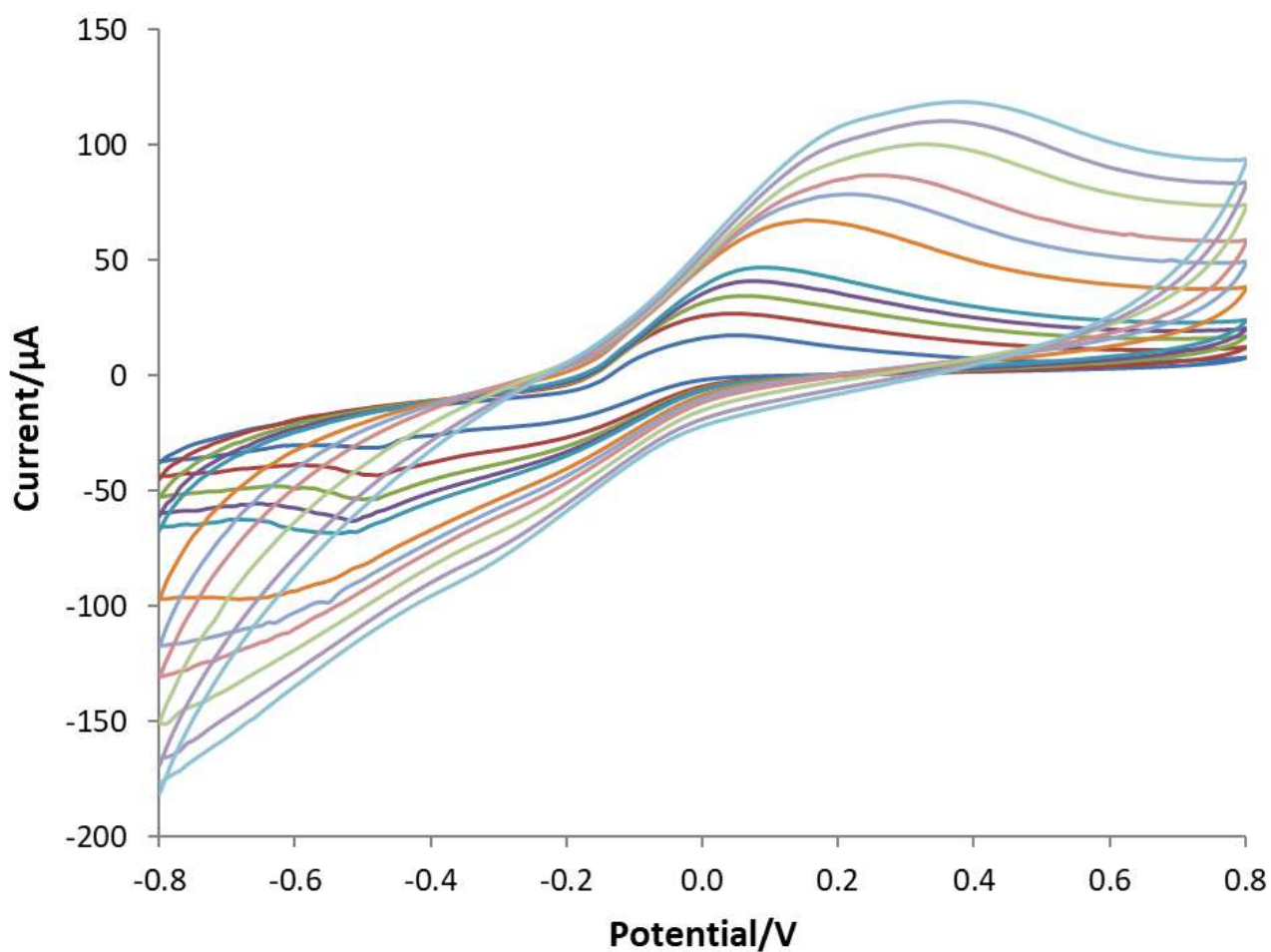
Pretreatment: wash with ethanol, rinse with distilled water and stir for 1 min in the probe solution before measurement.

Probe solution: $\text{K}_3\text{Fe}(\text{CN})_6$ 5mM/KCl 0.1M, pH 7

$E_{\text{start}} = -0.8 \text{ V}$; $E_{\text{end}} = +0.8 \text{ V}$

scan rates range: $0.01\text{-}1 \text{ V s}^{-1}$

Active area: $3.1(5) \text{ mm}^2$ (computed by Randles–Sevick's equation)



✓ *Repeatability and reproducibility tests*

Pretreatment: only rinse with distilled water and stir for 1 min in the probe solution before measurement.

Probe solution: $\text{K}_3\text{Fe}(\text{CN})_6$ 5mM/KCl 0.1M, pH 7

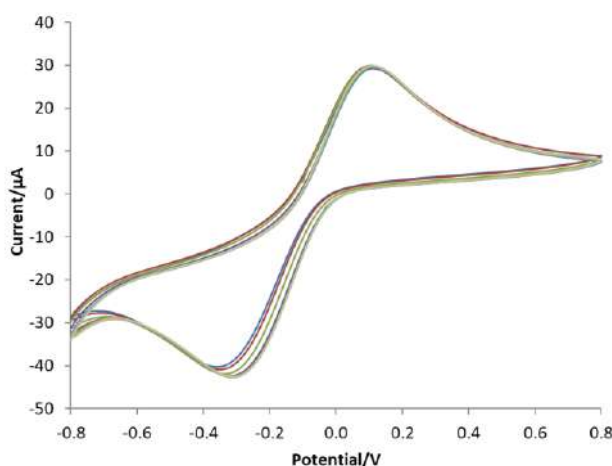
$E_{\text{start}} = -0.8 \text{ V}$; $E_{\text{end}} = +0.8 \text{ V}$

scan rate: 0.1 V s^{-1}

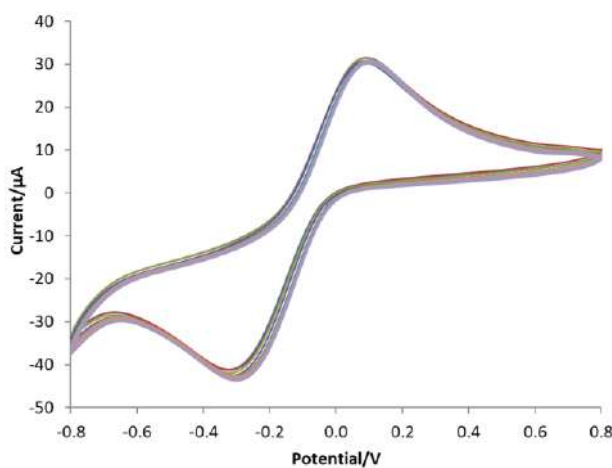
✗ 3 replicates of 10 CV scans with the same screen-printed cell

- 1st replicate: $I_{\text{pA}} = 32(1) \mu\text{A}$; $I_{\text{pC}} = -41(1) \mu\text{A}$ ($n = 10$ scans)
- 2nd replicate: $I_{\text{pA}} = 34.1(5) \mu\text{A}$; $I_{\text{pC}} = -41.7(6) \mu\text{A}$ ($n = 10$ scans)
- 3rd replicate: $I_{\text{pA}} = 34.8(4) \mu\text{A}$; $I_{\text{pC}} = -42.2(6) \mu\text{A}$ ($n = 10$ scans)

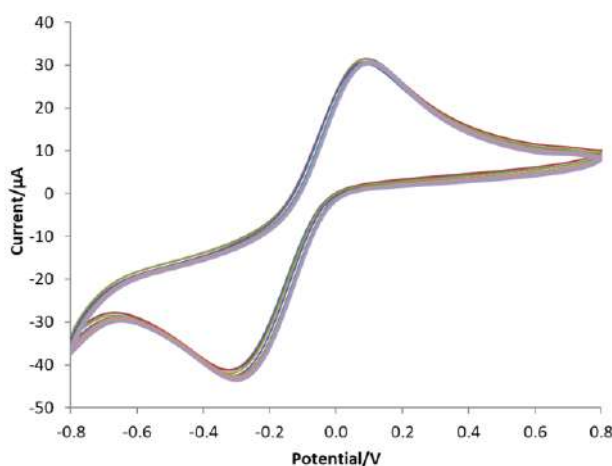
1st replicate



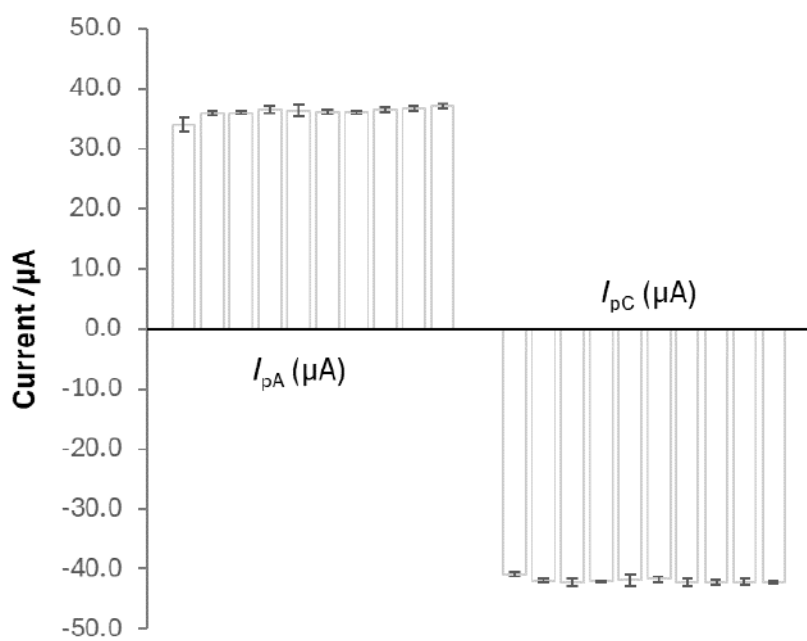
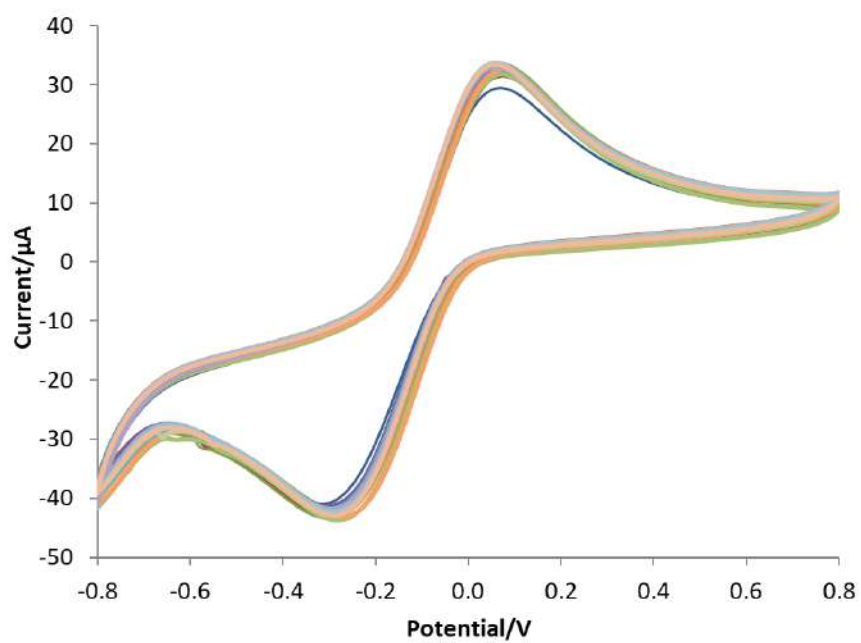
2nd replicate



3rd replicate



× 10 replicates of 3 CV scans with the same screen-printed cell



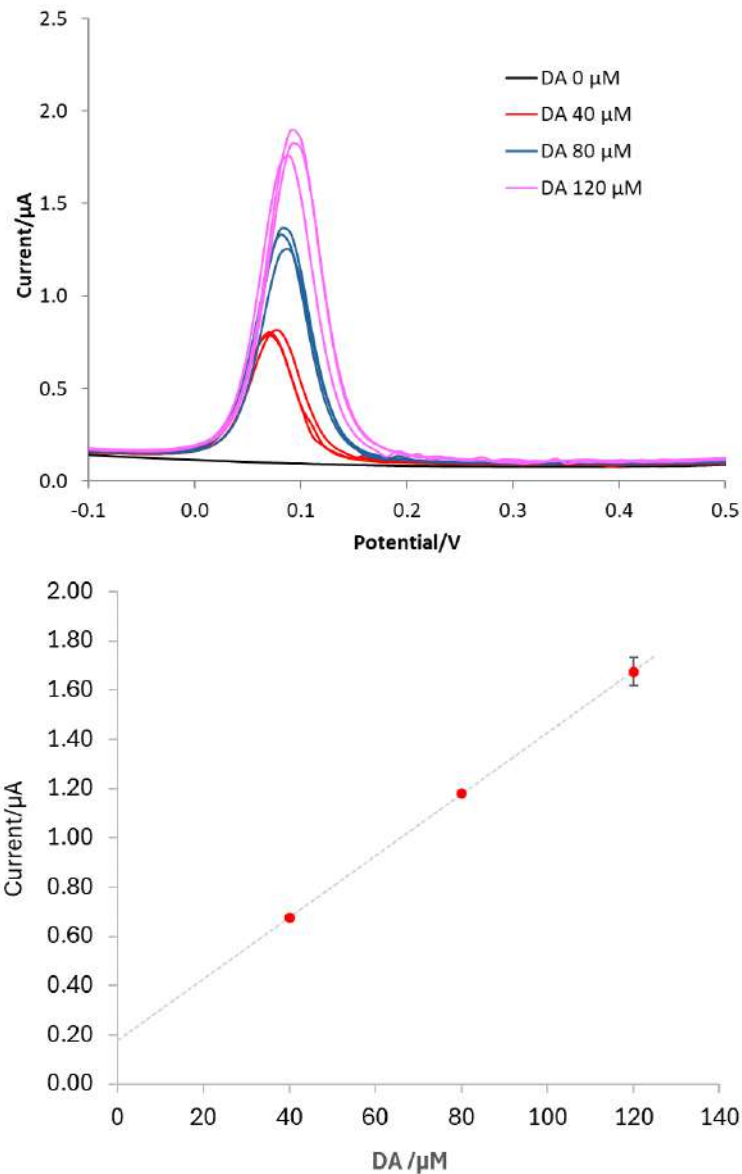
✓ *Example of application: DPV for Dopamine (DA) detection*

Pretreatment: only rinse with distilled water and stir for 1 min in the solution before measurement.

Electrolyte solution: 10 mL of PBS 0.1 M/KCl 0.1 M at pH 7

DPV parameters: $E_{\text{start}} = -0.3 \text{ V}$; $E_{\text{end}} = +0.6 \text{ V}$; $E_{\text{step}} = 0.01 \text{ V}$; $E_{\text{pulse}} = 0.025 \text{ V}$; $t_{\text{pulse}} = 0.2 \text{ s}$; scan speed = 0.02 V/s .

3 repetitions for each concentration, stirring 20 s before registering the voltammogram



Calibration curve: $I_p [\mu\text{A}] = 0.01252(1) \cdot C_{\text{DA}} [\mu\text{M}] + 0.176(4)$ $R^2 = 0.9999$

Detection limit = $0.8 \mu\text{M}$; Quantification limit = $2.4 \mu\text{M}$