

Differential Pulse Voltammetric Analysis of Cannabidiol on Fluorine-Doped Tin Oxide (FTO) Electrode Interface: Quantification in Pharmaceutical Oil with Assessment of Electrode Surface Stability

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Supplementary materials

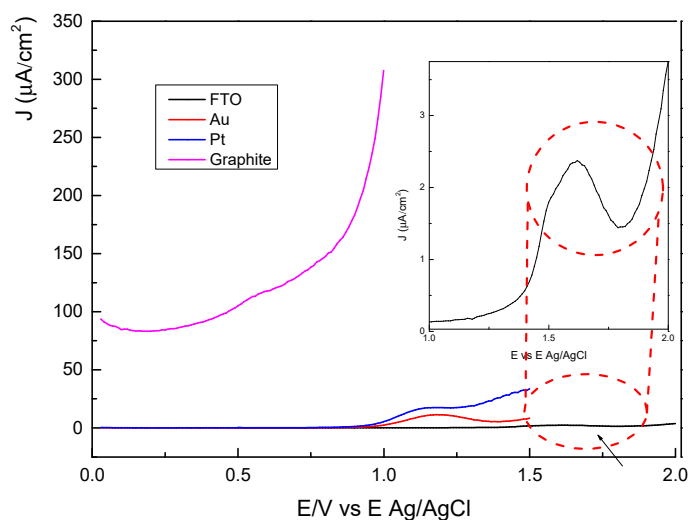


Figure S1. Differential pulse Voltammograms with CBD at 0.3 mM using different working electrodes, LiClO₄ 0.1 mol/L in ACN.

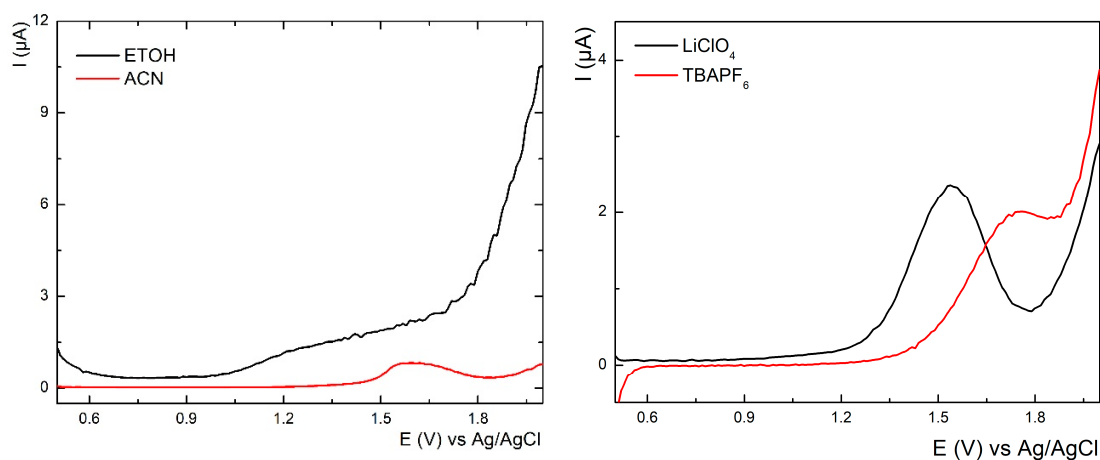


Figure S2. Differential pulse voltammograms of CBD 0.3 mM using FTO as the working electrode: a) evaluating LiClO_4 0.1 mol/L in different solvents, ACN and ethanol; b) in different electrolytes, LiClO_4 and TBAPF_6 (0.1 M) in ACN.

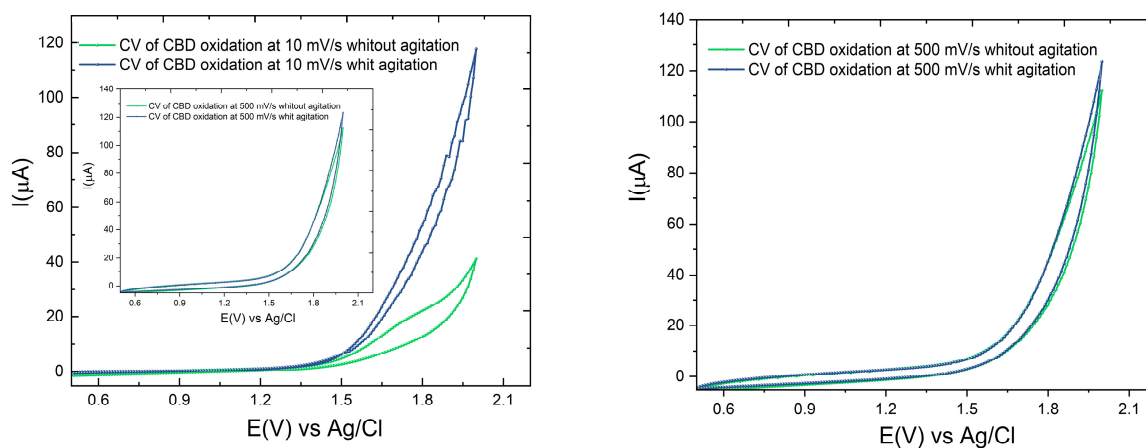


Figure S3: Cyclic voltammograms recorded during the irreversible oxidation of CBD at scan rates of 10 and 500 mV/s under steady-state conditions and with forced convection at 260 rpm. 150 μM CBD in 0.1 M $\text{LiClO}_4/\text{ACN}$

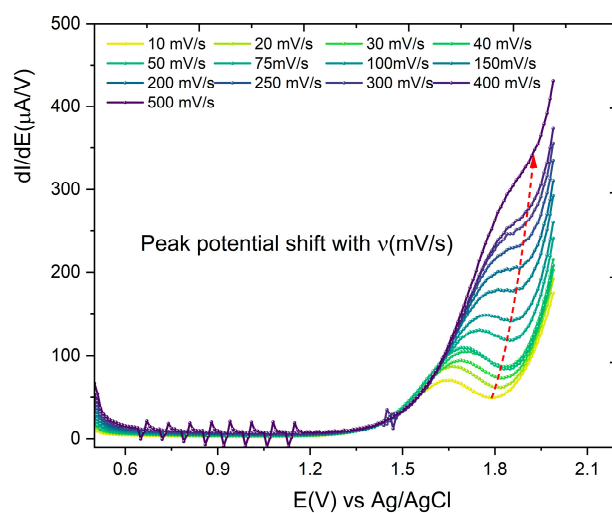


Figure S4. First derivative of the anodic sweep segment recorded in cyclic voltammetry during CBD oxidation at scan rates of 10, 20, 30, 40, 50, 75, 100, 150, 200, 250, 300, 400, and 500 mV/s. Peak potential shift as scan rate increases

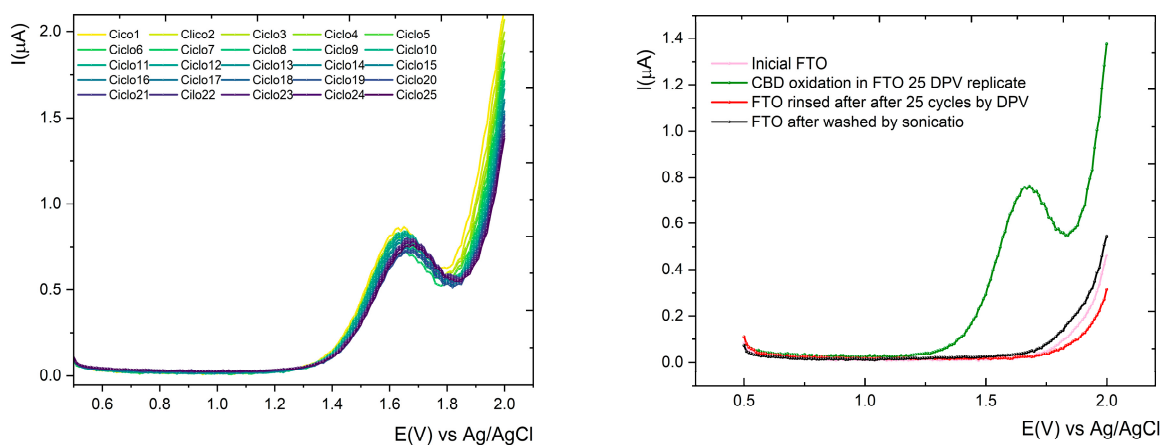


Figure S5. (a) Electrochemical oxidation of 150 μM CBD at the CBD/FTO interface by cyclic voltammetry (25 replicates) in 0.1 M LiClO₄/ACN by DPV, (b) DPV responses of the FTO electrode before CBD oxidation (black), after CBD oxidation (red), the 25th cyclic voltammogram recorded during the electrochemical oxidation of CBD

(green), and after ultrasonic cleaning (magenta). The inset shows an enlarged view comparing the voltammetric responses of the FTO electrode before CBD oxidation and after ultrasonic cleaning

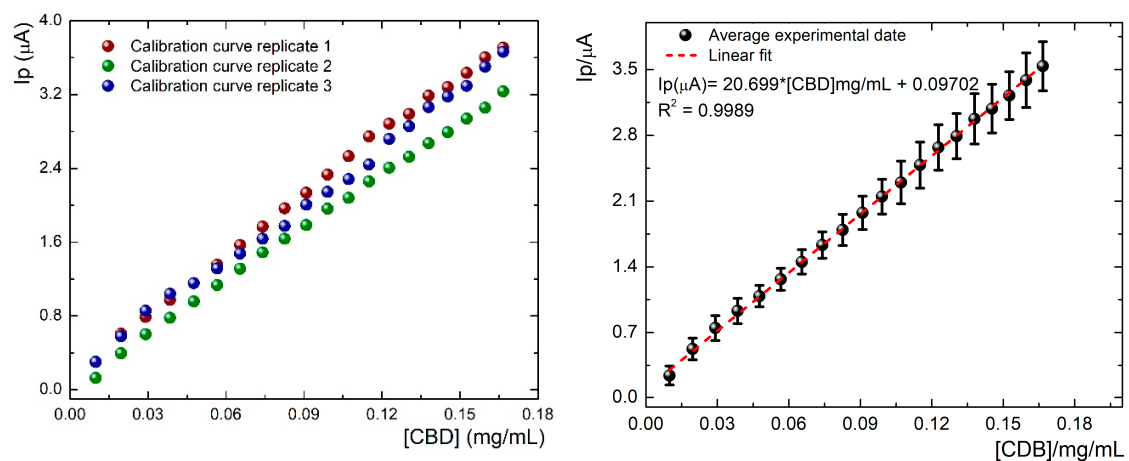


Figure S6. Replication of the calibration curves obtained by DPV, $n=3$.

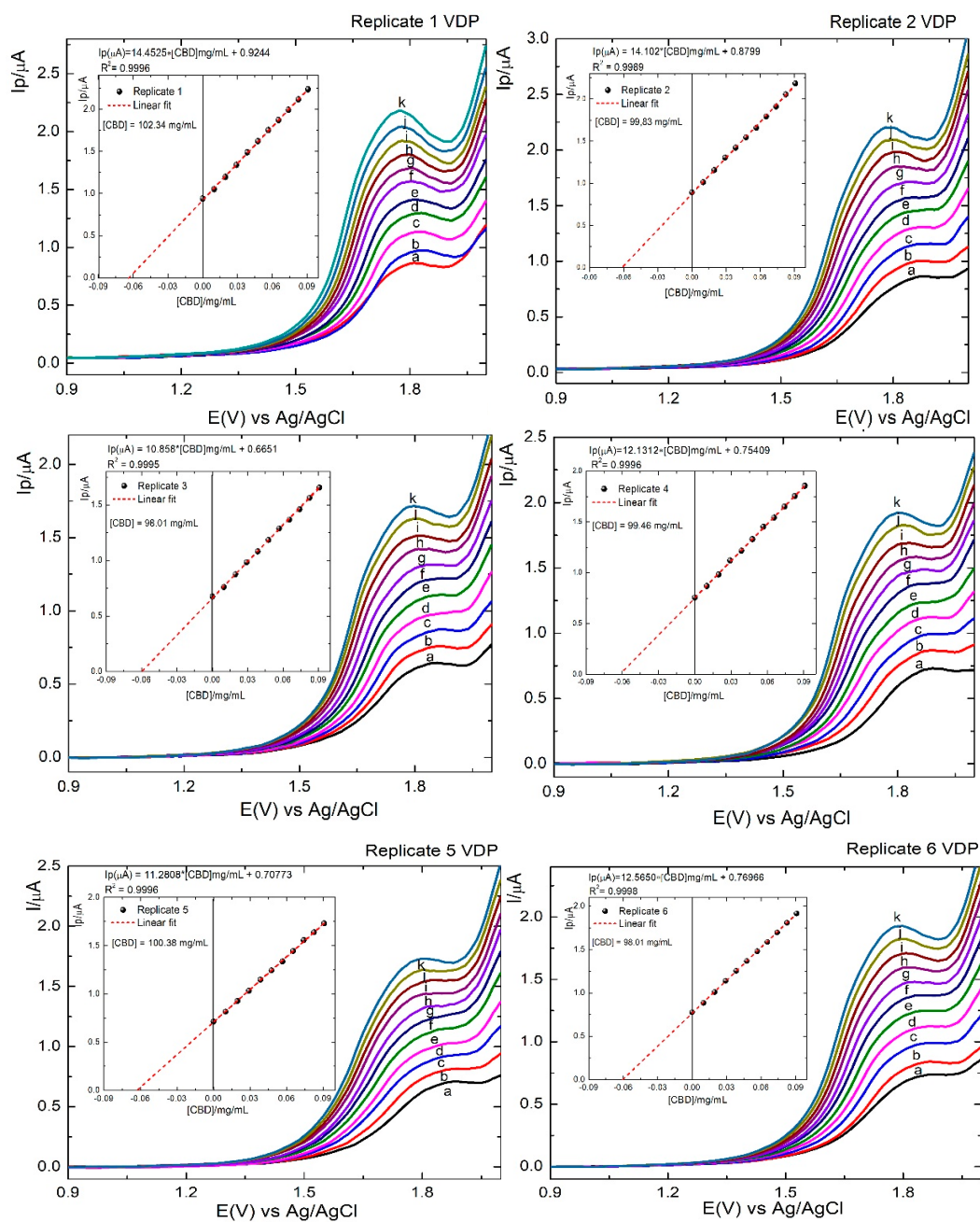


Figure S7. Recorded differential pulse voltammogram (DPV) of replicates made during standard addition of CBD to a commercial medicinal cannabis sample ($n = 6$), interface: FTO/LiClO₄ 0.1 mol/L, and calibration curve (Insert). (a) 0.0000; (b) 0.0099 (31.4 μM); (c) 0.0196 (62.3 μM); (d) 0.0291 (92.5 μM); (e) 0.0385 (122.4 μM); (f) 0.0476 (151.4 μM); (g) 0.0566 (180.0 μM); (h) 0.0654 (208.0 μM); (i) 0.0741 (235.6 μM); (j) 0.0826 (262.7 μM) and (k) 0.0909 (289.1 μM); mg/mL of CBD.

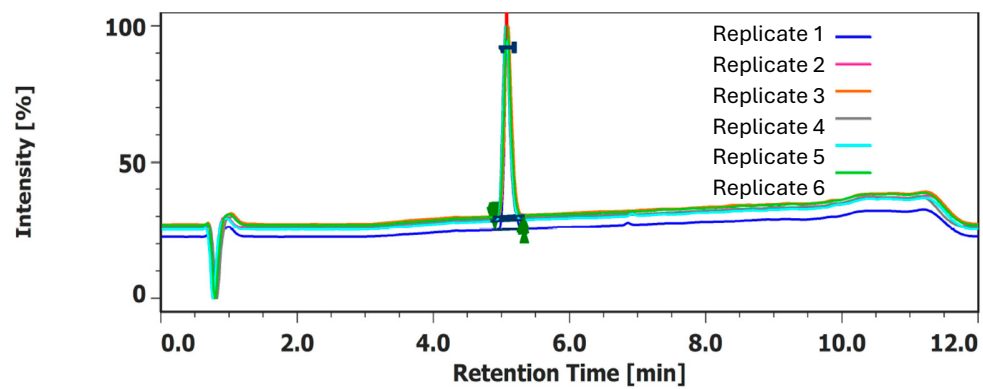


Figure S8. Chromatograms recorded in the chromatographic measurements to determine the CBD content in the pharmaceutical sample, $n=6$.