Electronic Supplementary Material (ESI) for Analyst.
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Supporting Information to:

Electrochemical Analysis of Speedball-like Polydrug Samples

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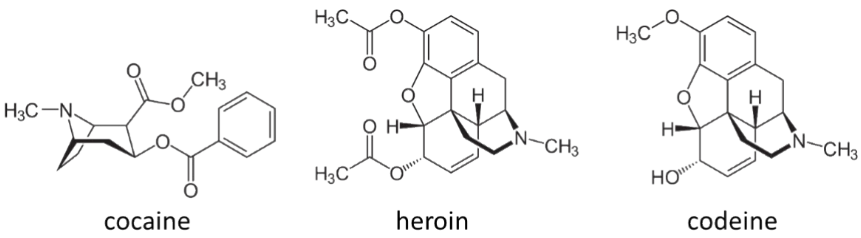

Figure S-1. Chemical structures of COC, HER and COD.

Figure S-2 shows the importance of applying a correction factor to the peak potential values of the cocaine signal if cathodic pretreatment is performed, clearly showing this potential shifts to different values when different parameters are applied for the pretreatment.

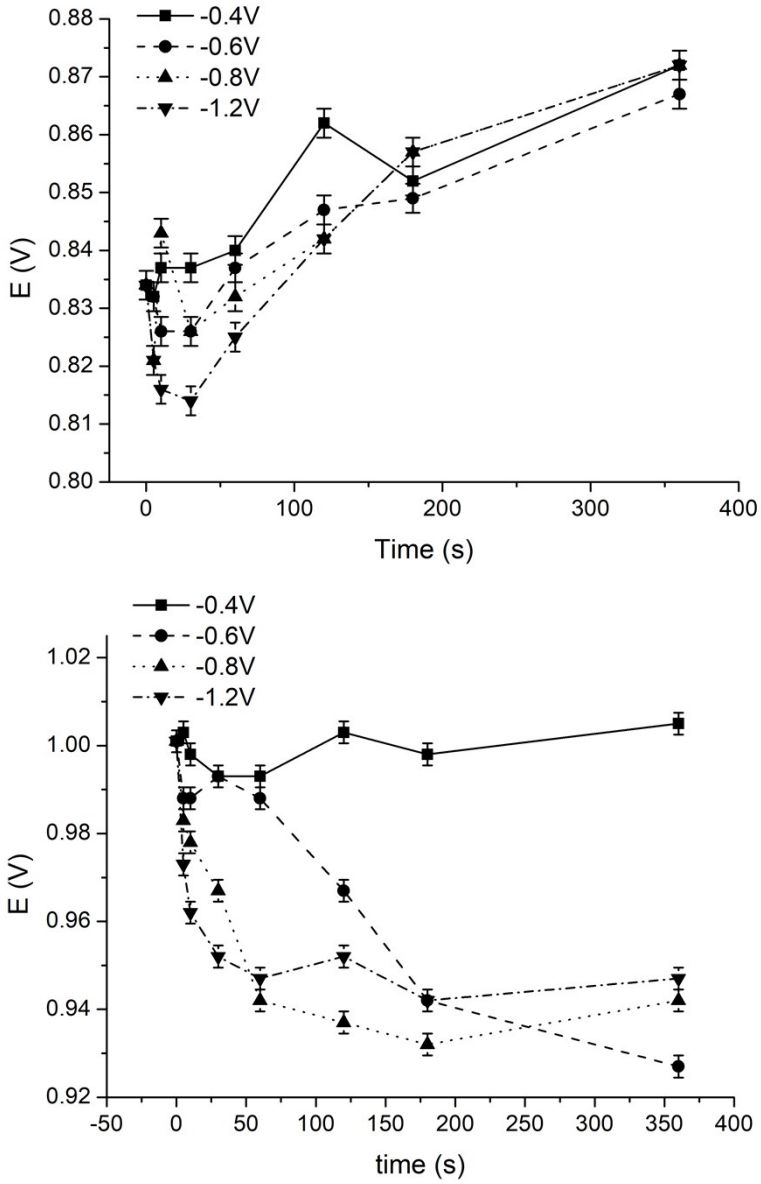

Figure S-2: Peak potentials obtained for the oxidation of a pure COC solution (1 mM) after cathodic pretreatment with different potential values and different time periods in (A) pH 12 buffer and (B) pH 7 buffer.

Using pH 7 buffer, multiple pretreatment parameters provide a solution for the detection of cocaine in mixtures with heroin. Figure S-3 shows all these suitable conditions where the signals of cocaine and heroin could be distinguished, in addition showing the intensity of the cocaine signal as well.

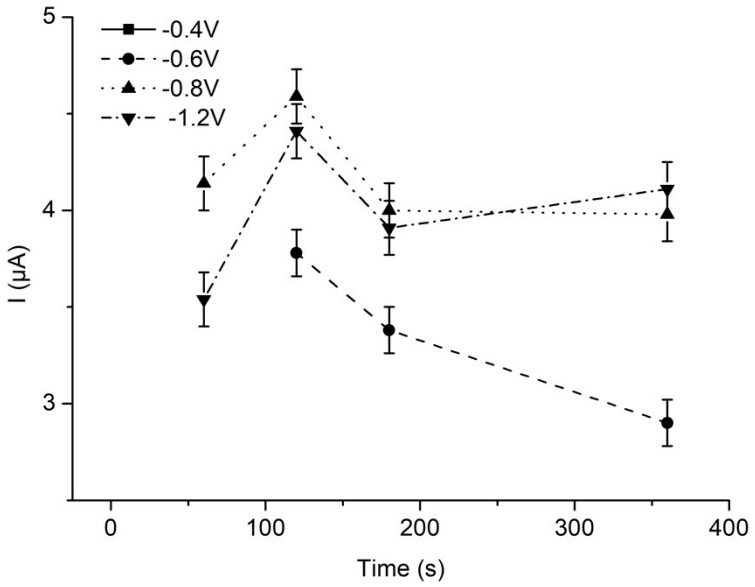

Figure S-3: Peak currents obtained for the oxidation of COC in a binary mixture (1:0.5 mM) with HER in pH 7 buffer after cathodic pretreatment with potential values -0.4, -0.6, -0.8 and -1.2 V and time periods 0, 5, 10, 30, 60, 120, 180 and 360 s.

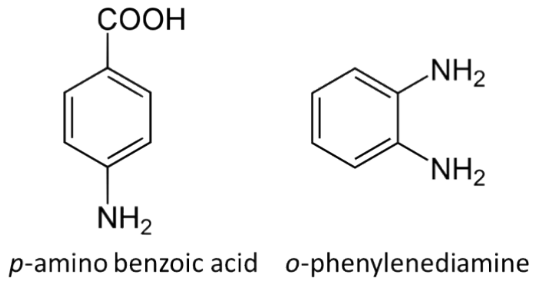

Figure S-4. Chemical structure of the PABA and OPD monomers.

Figure S-5 shows the data of the electropolymerization process of orthophenylenediamine on the graphene modified screen printed electrode. The increasing intensity with each scan around potential 0 V shows the polymerization is successful.

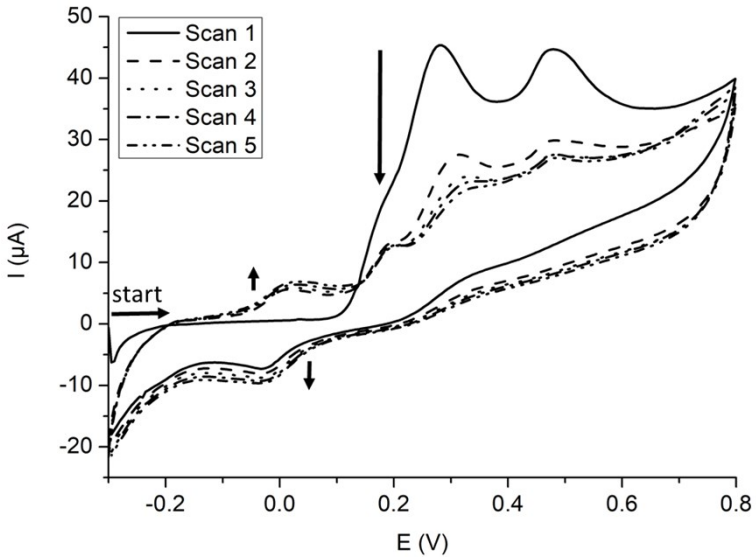

Figure S-5: Cyclic voltammograms for electrochemical polymerization of 1 mM OPD in PBS pH 7 at GPH-SPE. Scan rate 50 mV/s.