

Supplementary Information

Chemically-Activated Biochar from *Ricinus communis* L. Cake and Their Potential Applications for the Voltammetric Assessment of Some Relevant Environmental Pollutants

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Electrodes construction

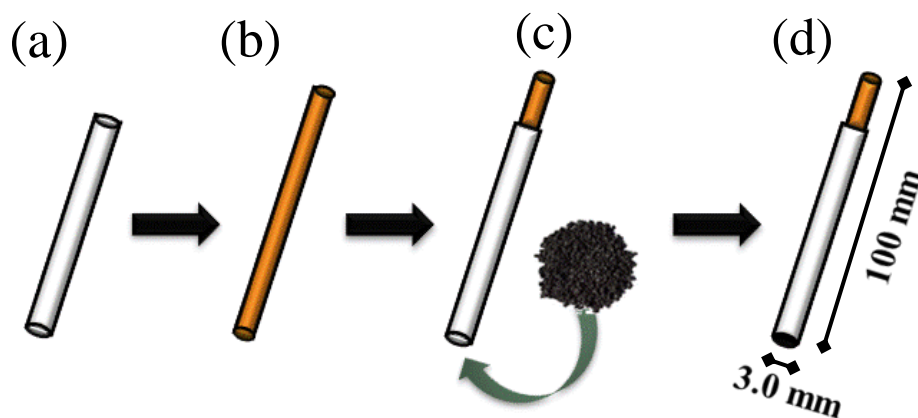


Figure S1. Components used for the proposed electrodes construction: (a) polyvinyl chloride (PVC) support; (b) copper rod and (c) carbon paste. (d) Electrode containing the carbon paste incorporated ready for use.

Scanning electron microscopy (SEM) analysis

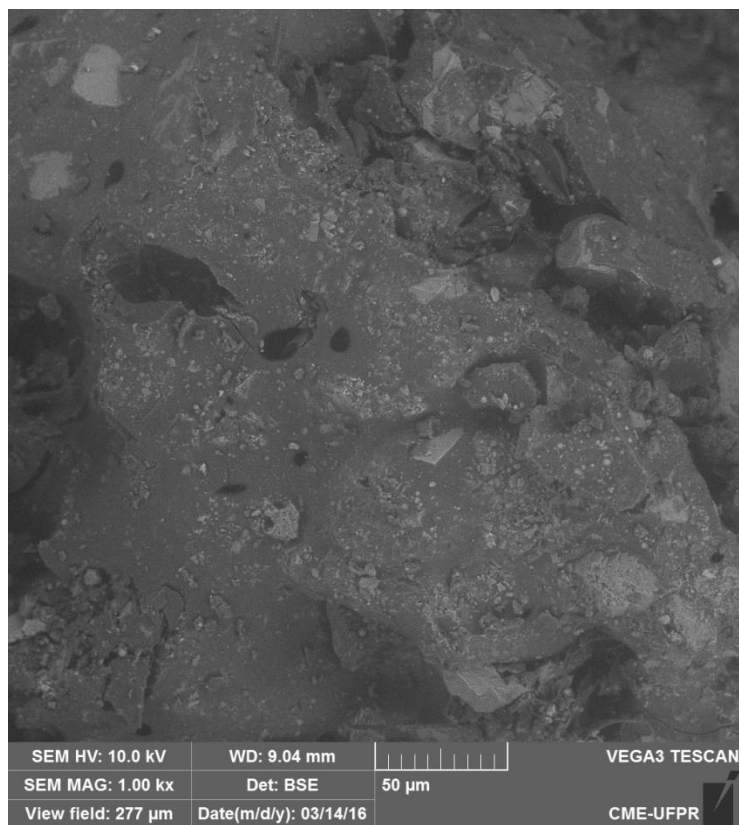


Figure S2. SEM image obtained for precursor biochar surface (pristine) with 1000 times magnification.

Thermogravimetric analysis

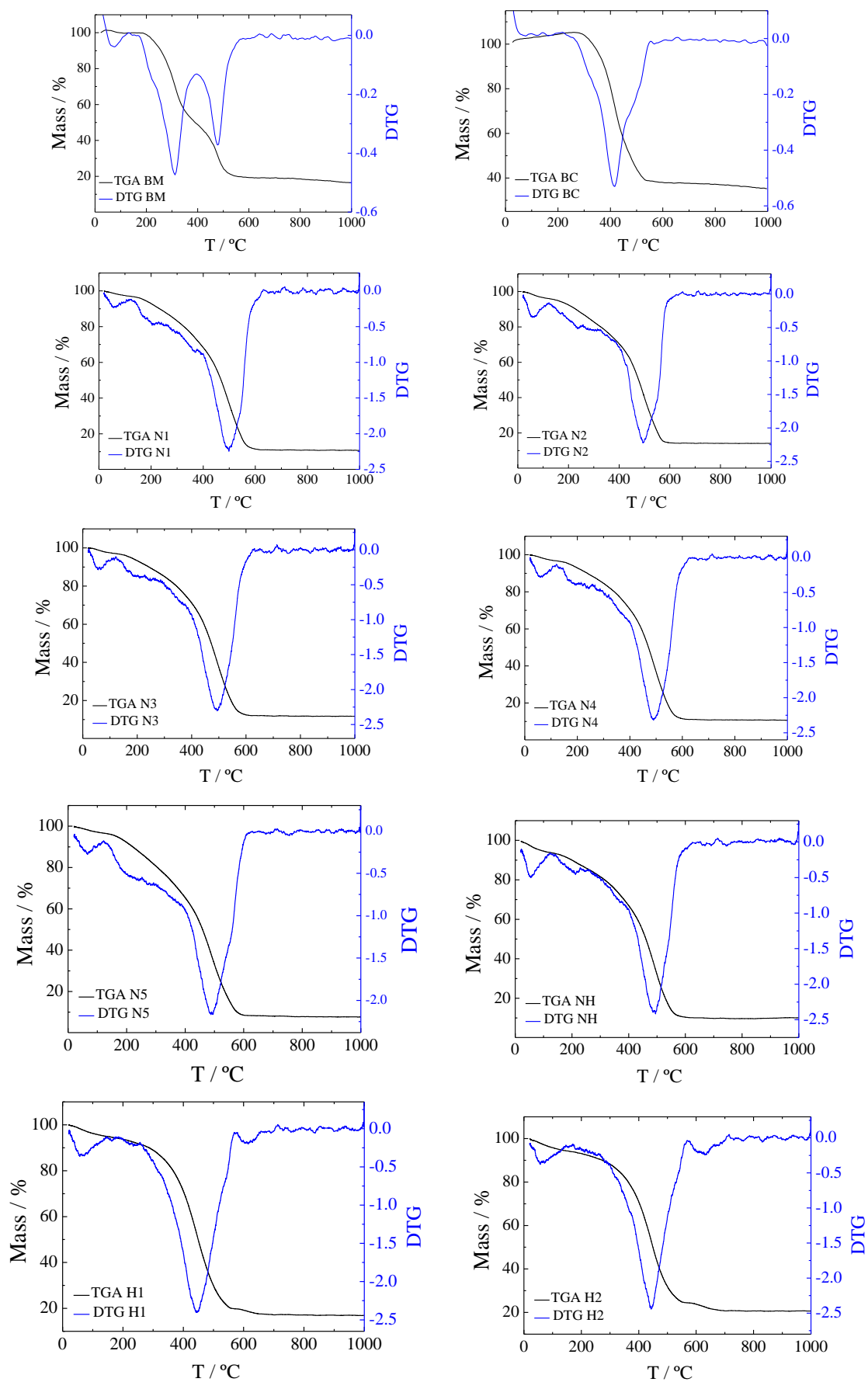


Figure S3. TGA and DTG curves obtained for castor meal biomass (BM), precursor and activated biochar samples.

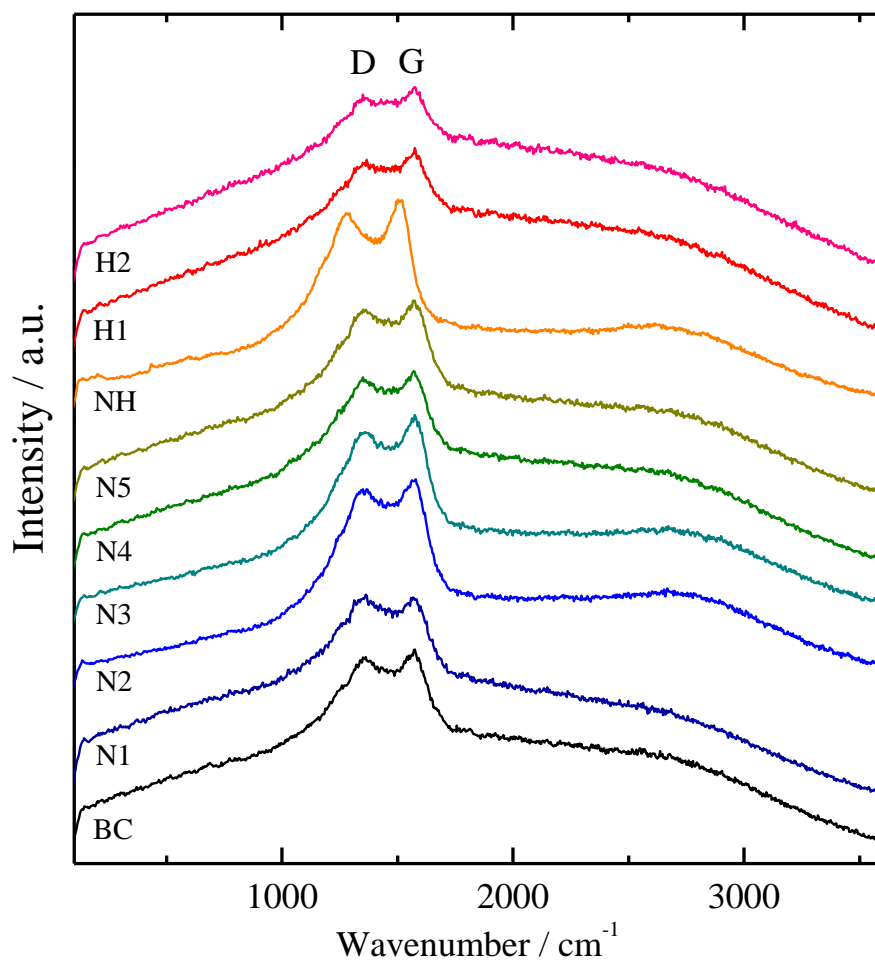


Figure S4. Raman spectra obtained for precursor and activated biochar samples in the region between 200 and 3000 cm^{-1} .

Voltammetric characterization

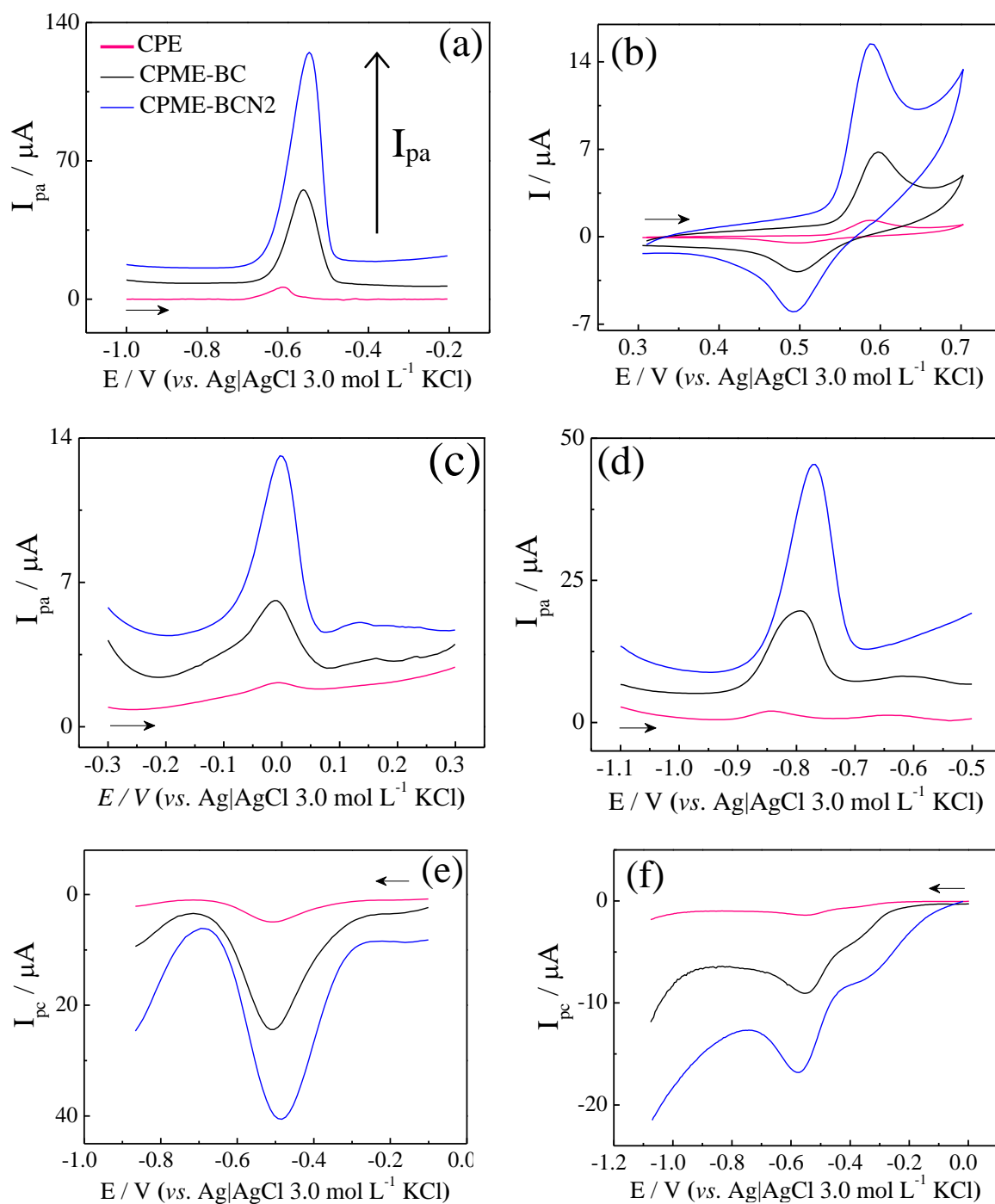


Figure S5. Voltammograms obtained for (a) Pb^{2+} ; (b) Ni^{2+} ; (c) Cd^{2+} and (d) Cu^{2+} ions; (e) PQ and (f) MP pesticides with CPE (—), CPME-BC (—) and CPME-N2 (—). Open circuit potential spontaneous preconcentration, for 5.0 min.