An electrochemical sensing platform based on adsorption residue for Dopamine

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Metal oxides are inexpensive and efficient adsorbents for dye effluent; however they generate a secondary residue which is toxic. Currently, there is no clear protocol on how to dispose of this toxic waste. Herein, we demonstrate that under carbo-thermal conditions this residue is transformed into a carbon/metal oxide composite (g-C/MO) which is highly sensitive and selective towards dopamine. XPS and HR-TEM are used to show that g-C/MO consists of a metal redox couple encapsulated in a porous-heteroatom-doped-graphitic carbon shell which serve as the active sites. A glassy carbon (GCE) modified g-C/MO electrode displays low detection limit (~ 97 nM) and robust selectivity under interfering conditions.