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One-step synthesis of porous cuprous oxide microspheres on reduced graphene oxide for selective detection of mercury ions

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Electronic Supplementary Information

To prove that GO has been reduced to rGO, C(1s) core-level XPS data were measured. Fig. S1 demonstrates that oxygen-contained groups are observed in the C(1s) core-level XPS spectrum of GO. However, only one peak at ~284.6 eV was fitted out in the C(1s) core-level XPS spectrum of rGO, which is attributed to the C−C group.

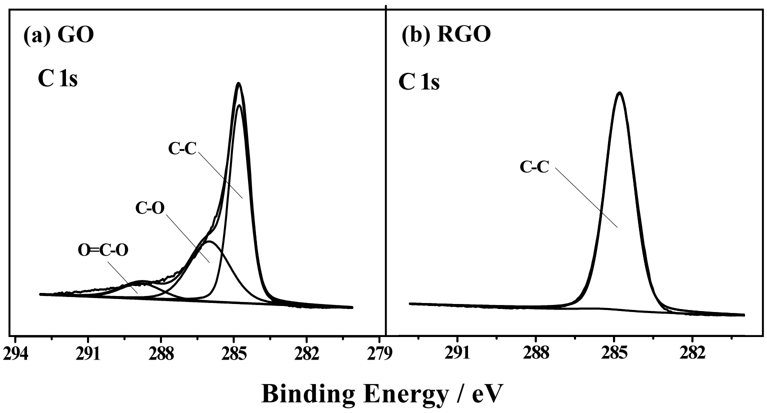

Figure S1. C 1s core-level XPS spectra of GO and rGO.

To investigate the effect of the coverage of the composite on the electrode, EIS data of the composite electrodes dropped with different concentrations of Cu_2OMS-rGO were collected and shown in Fig. S2a. It shows that the value of ΔR_{ct} approaches to an equilibrium when the concentration of Cu_2OMS-rGO is 15 μL. This concentration was used to prepare the composite electrode in the manuscript to ensure the full coverage of Cu_2OMS-rGO onto the electrode surface. Additionally, in order to prove the bare electrode is not contributing to the detection of Hg^{2+}, the relative EIS data was added as Fig. S2(b). Both the immobilization of DNA and the coordination of Hg^{2+} with DNA do not lead to a substantial change in the R_{ct} value, indicating there is no interference between the coordination of the DNA helix with Hg^{2+} ion and the bare electrode.

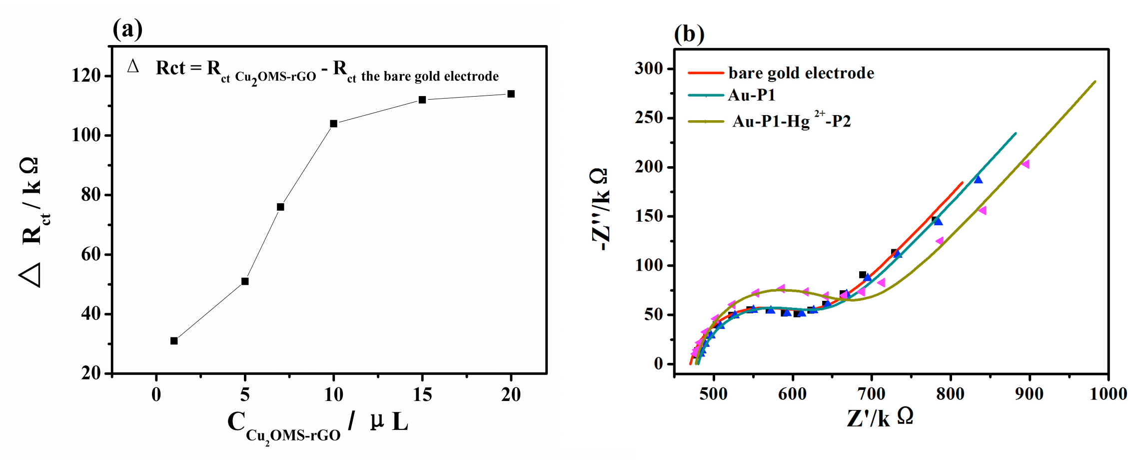

Figure S2. (a) The relationship between the concentration of Cu_2OMS-rGO composite and the difference of R_{ct} value and (b) EIS Nyquist plots of the Hg^{2+} detection based on the bare gold electrode.