Supporting Information

CVD graphene transfer procedure introduces metallic impurities which alter the graphene electrochemical properties

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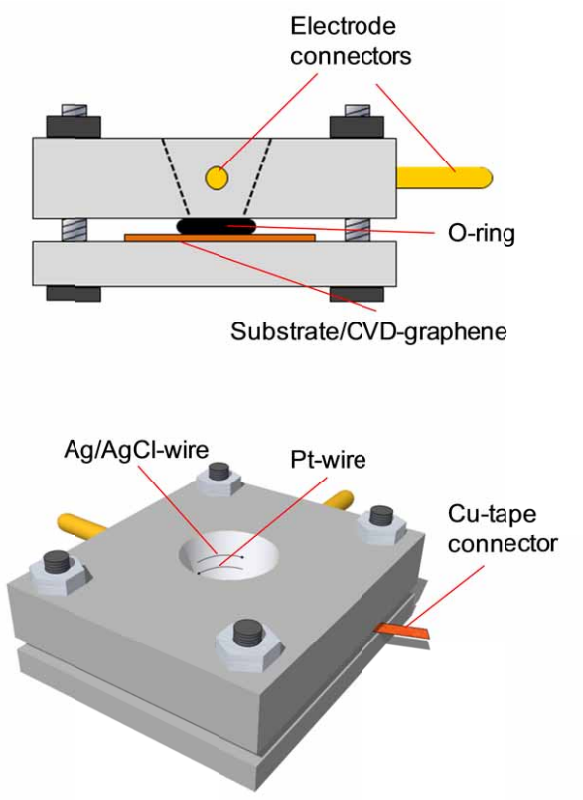

Figure S1. Schematic of the electrochemical cell used for the measurements. It consists of a flat bottom part where the metal/CVD-graphene sample is placed; and an upper part with a conical hole which functions as reservoir. A rubber o-ring (I.D. = 4.5 mm; O.D. = 8.1 mm) and four screws ensure a secure and sealed chamber to be filled with the measurement solution for a total surface area of 17 mm^2 for the CVD-Graphene sample to be examined. The metal/CVD-graphene acts as the working electrode while a Pt and Ag/AgCl wire immersed in the solution act as the auxiliary and reference electrode, respectively. The size of the o-ring defines the portion of the CVD-graphene surface investigated. A Cu tape was used to ensure the electrical connection between the metal/CVD-graphene and the voltammetric instrument. All electrochemical potentials are stated versus Ag/AgCl reference electrode.

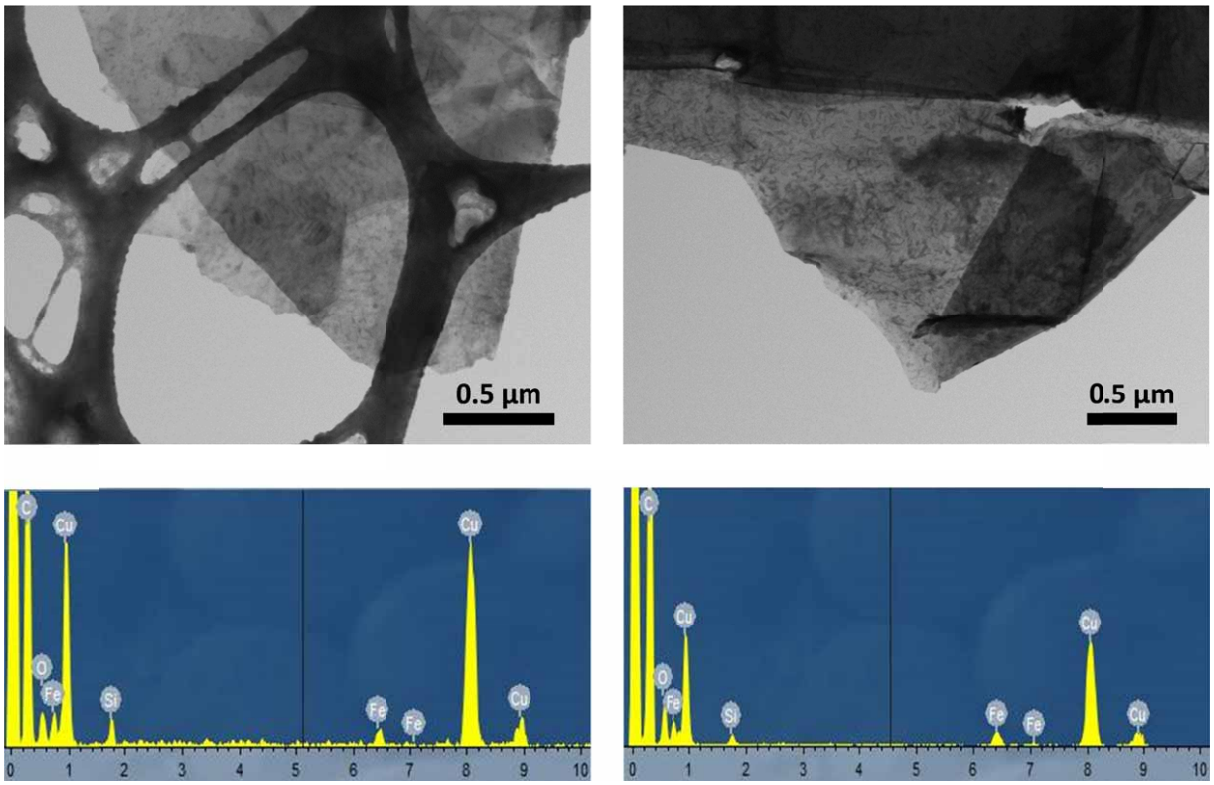

Figure S2. STEM images of different samples of CVD-graphene after the washing steps in distilled water to remove excess $FeCl_3$ solution. EDX analyses were performed on the entire area illustrated and the spectra are presented correspondingly. In both cases, Fe impurities were detected which confirmed the contamination from the Fe based etching solution.

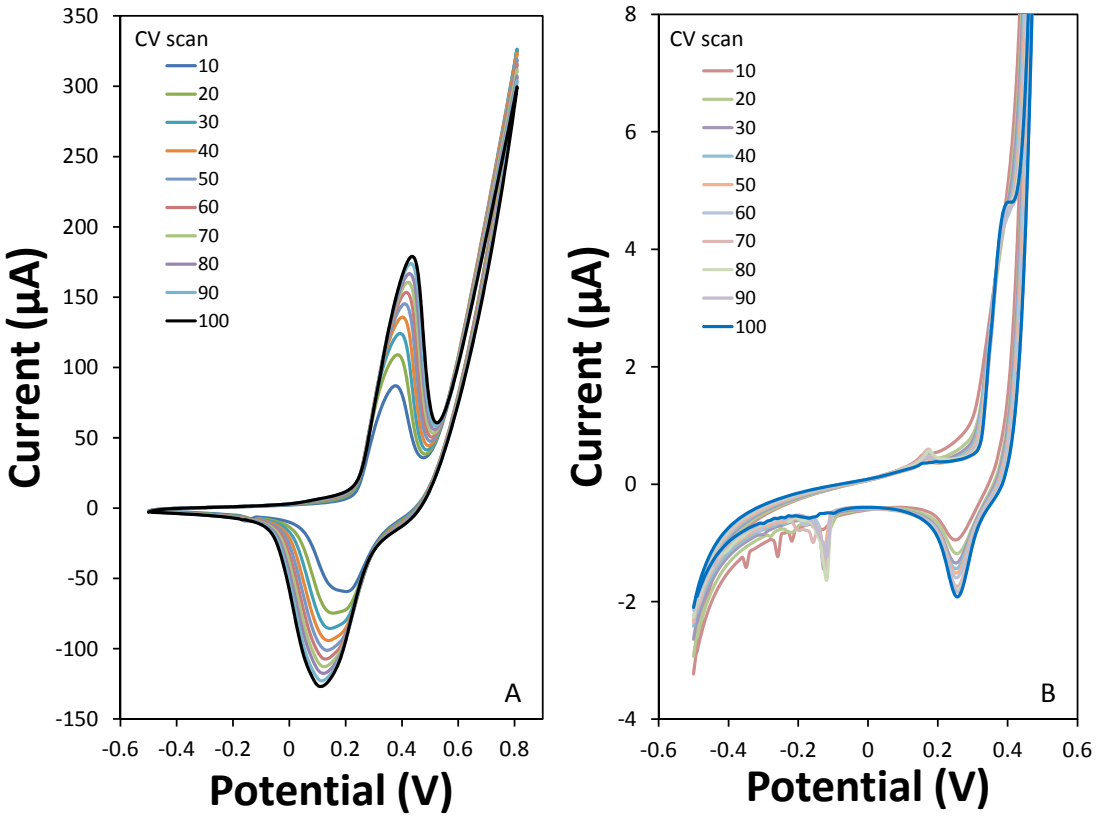

Figure S3. One hundred successive cyclic voltammograms recorded in 0.1 M NaOH solution using A) Ni foil and B) CVD-graphene transferred onto a glass slide. Successive potential scans resulted in the thickening of $Ni(OH)_2$ layer on the Ni metal surface which was then electrochemically oxidized and reduced. The increment of both the oxidative and reductive signals is common when Ni foil is adopted as a working electrode. When the transferred CVD-graphene was used as electrode, the same phenomenon occurred although at much lower scale due to the fact that only residual amount of Ni impurities were present.