Chemical Bond Formation between Vertically Aligned Carbon Nanotubes and Metal Substrates at Low Temperatures

Chaminda Nawarathne, Md Abdul Hoque, Chethani Ruhunage, Connor Rahm and Noe T. Alvarez*

[†]Department of Chemistry, University of Cincinnati, Cincinnati, OH 45221, United States

*E-mail: alvarene@ucmail.uc.edu,

Tel: 513-556-9370

Supporting information

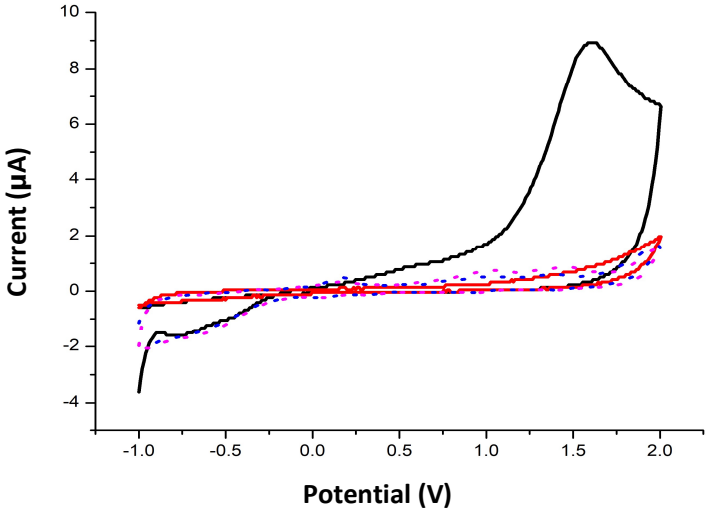

Figure S1*. Cyclic voltammograms recorded on a standard Pt electrode (1.6 mm diameter) in (Solid line black for first scan, solid line red for second scan) 0.1 M ethylenediamine in acetonitrile with Lithium trifluoromethanesulfonate (0.01 M) as a supporting electrolyte with scan rate of 50 mV/s to identify ethylenediamine oxidation on electrode surface. (Dotted line-without ethylenediamine, pink for first scan, blue for second scan)*

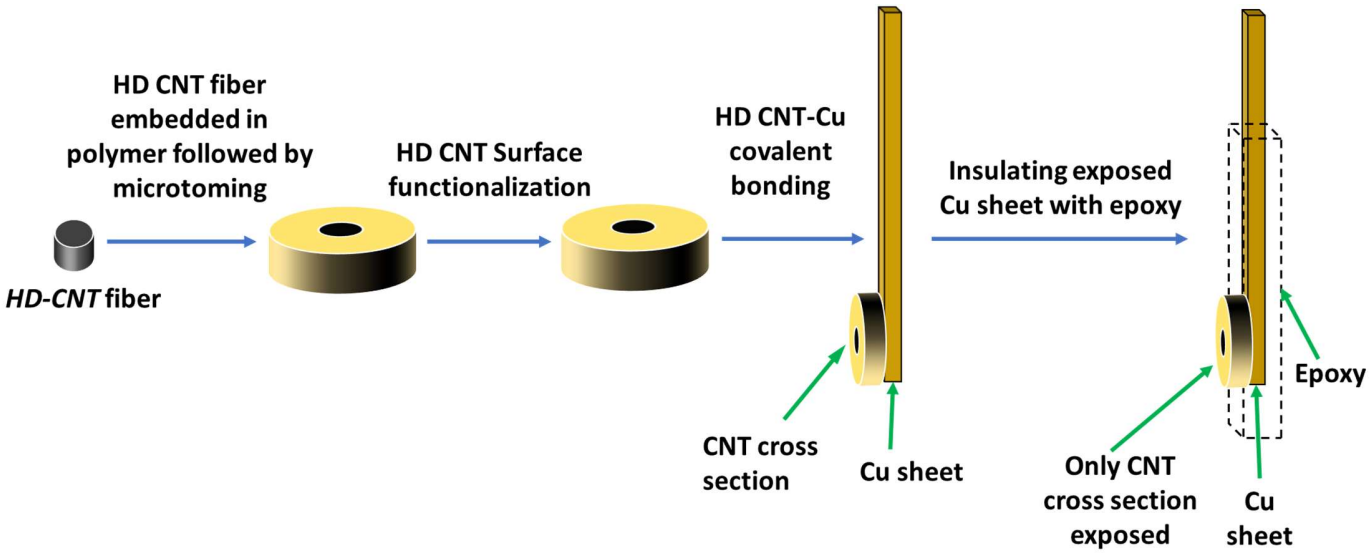

Figure S2. *Schematic showing the process used to fabricate the CNT bonded to metal electrode. HD-CNT fiber was embedded into polymer and CNT cross sections (~30-40 μm) were prepared by microtoming. CNT cross sections were attached to the Cu metal sheet after suitable functionalization and exposed metal surface was fully covered with polymer.*

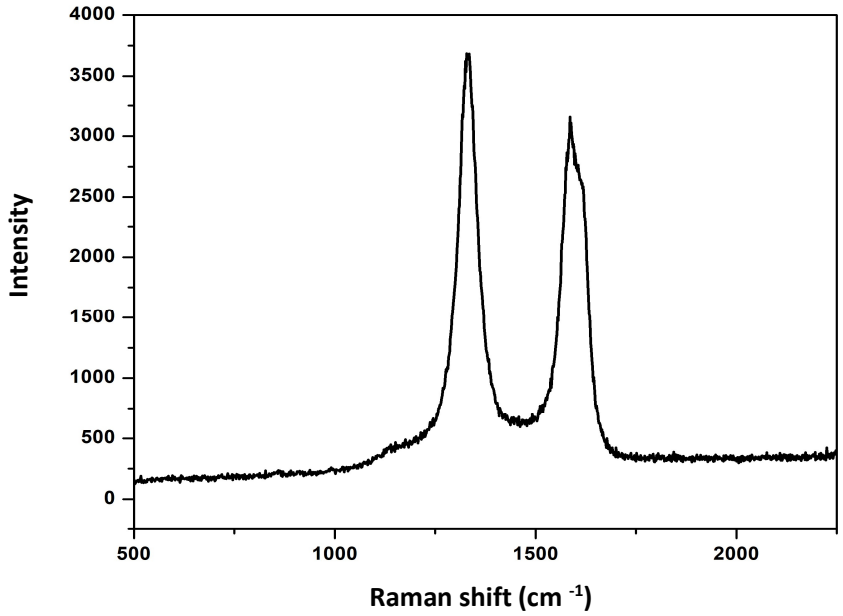

Figure S3. *Raman spectra of Cu surface after CNT attachment.*

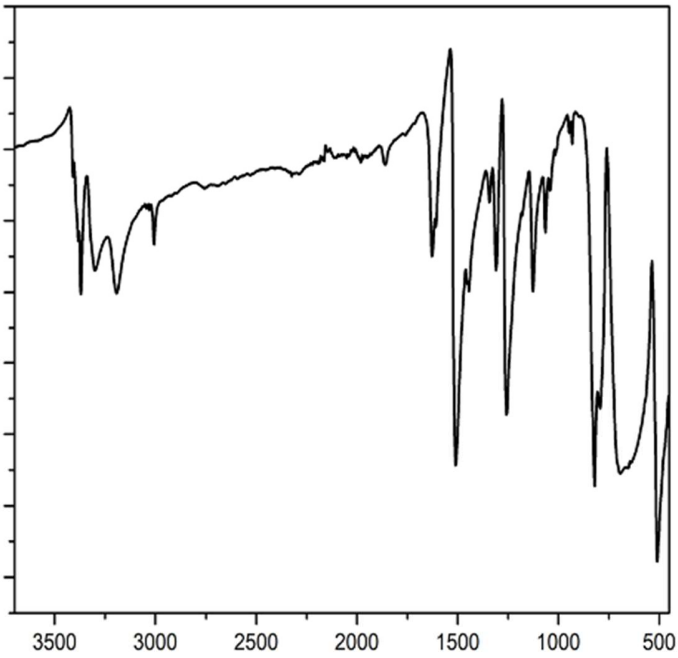

Figure S4. *FTIR spectra of pure 4-phenylenediamine.*

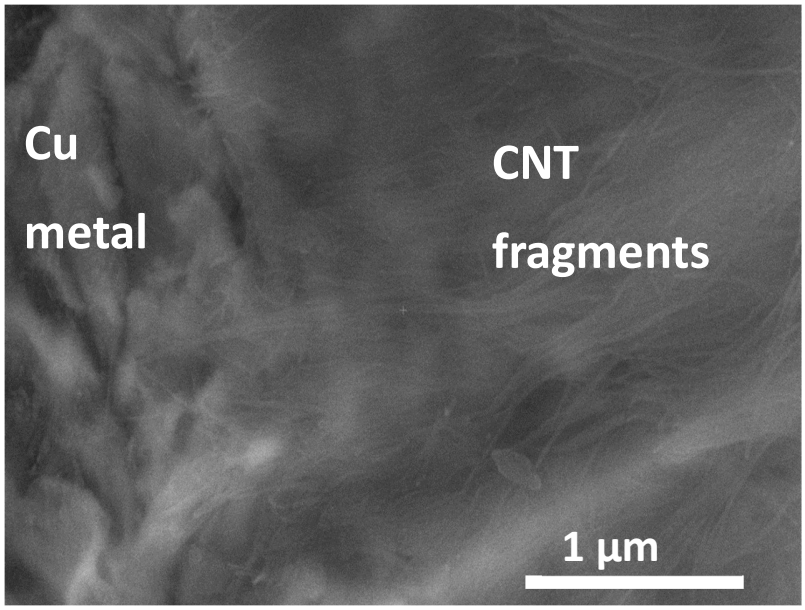

Figure S5. High magnified SEM images of CNT attached Cu metal surface after sonication.