Supporting Information

Figure S1. Grazing angle FT-IR spectra of (a) MHA on Au substrate and (b) Cu^{2+} ions coordinated on MHA covered Au substrate.

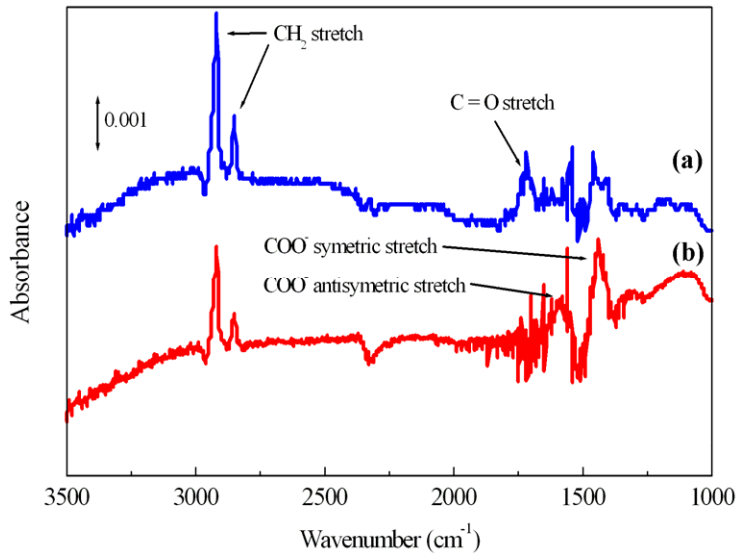

Figure S2. Lateral size of Cu dots vs. electroless deposition time.

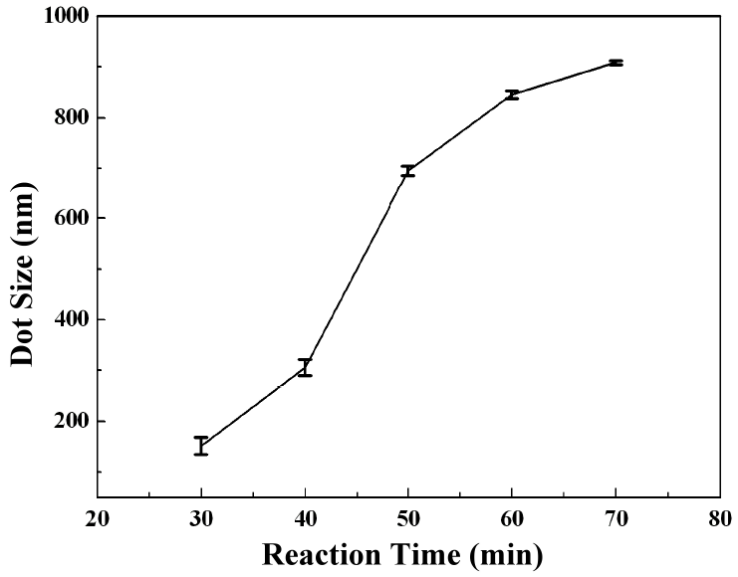

Figure S3. Cu nanostructure deposited on molecular patterns (a) with Cu^{2+} coordination with –COOH of MHA SAMs and (b) without the adsorption of Cu^{2+}.

(a) (b)

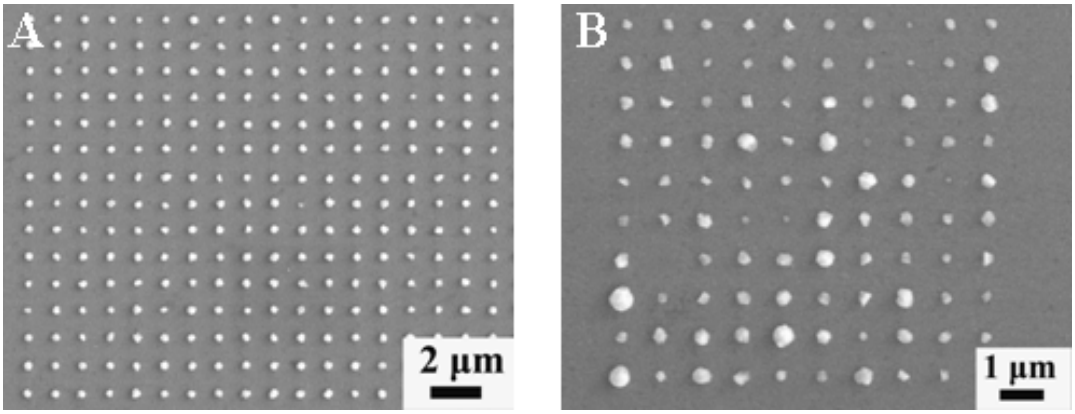

Figure S4 (a) Original MHA dot patterns prepared by DPN. (b) The growth of Cu dots on MHA patterns in (a). Cu lines were formed through the growth of Cu dots with extended electroless deposition time.

(a) (b)

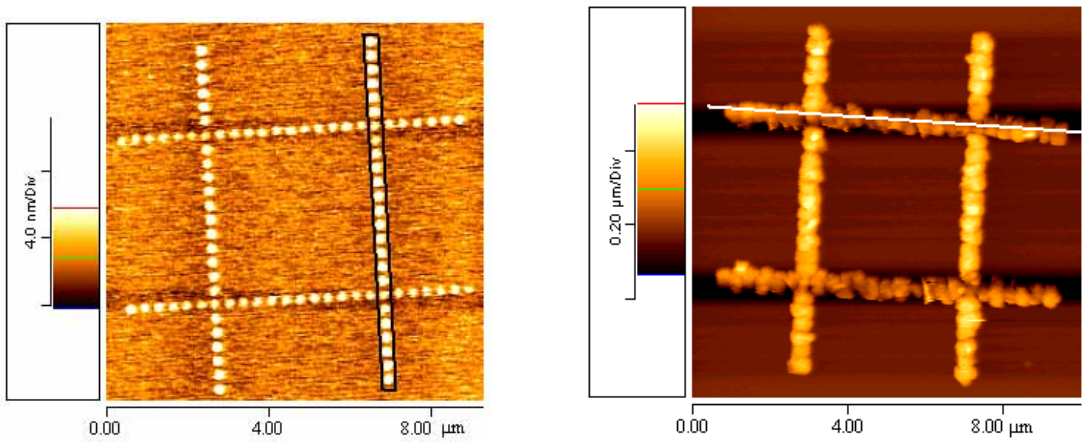

Figure S5. (a) A TMAMF images of a 15 * 15 Cu nanostructure array. (b) The current image of (a) was obtained by applying -4 and +4 bias applied from gold substrate to copper and vice versa to upper seven rows and lower eight rows, respectively.

(a) (b)

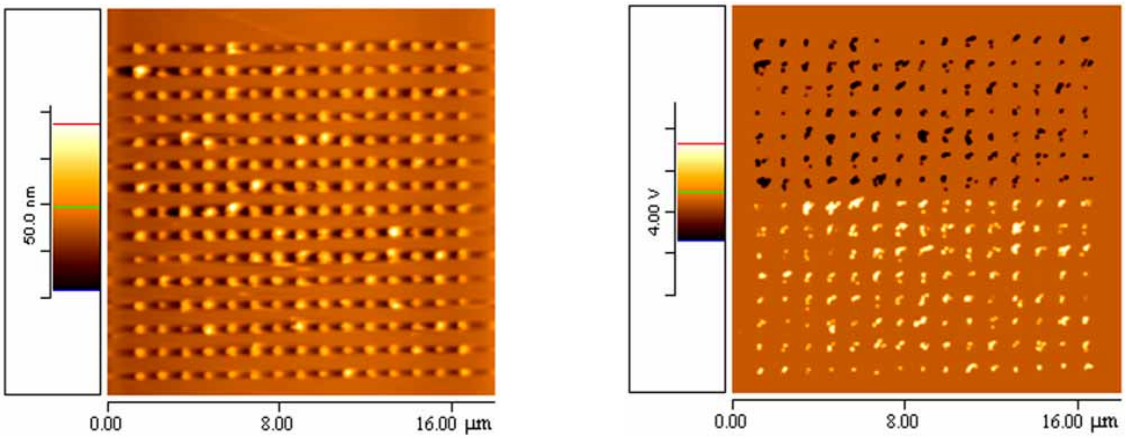

Figure S6. The average current density plotted versus the applied voltage transformed from four molecular junctions in Figure 4C.