Supplementary Material (ESI) for Nanoscale

Supporting information

Electrochemical Synthesis of Ag^0/Ag_2S Heterojunctions Templated on pre-formed Ag_2S Nanowires

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Size distribution of the Ag_2S NW

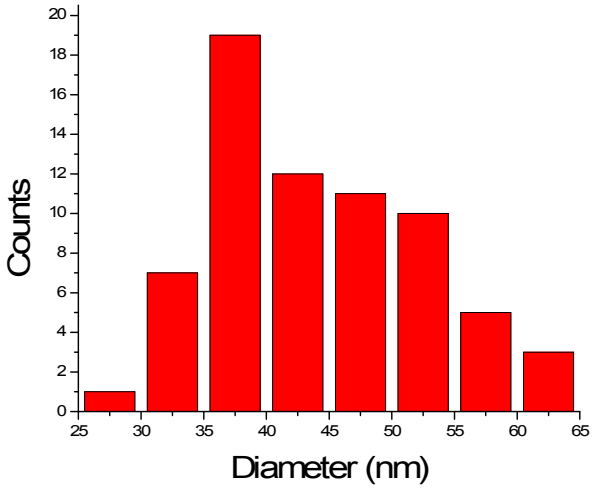

Figure S1: Size distribution of the Ag_2S NW

IV curves of the Au/Ag_2S NW/Au junctions as a function of side and electrolysis time

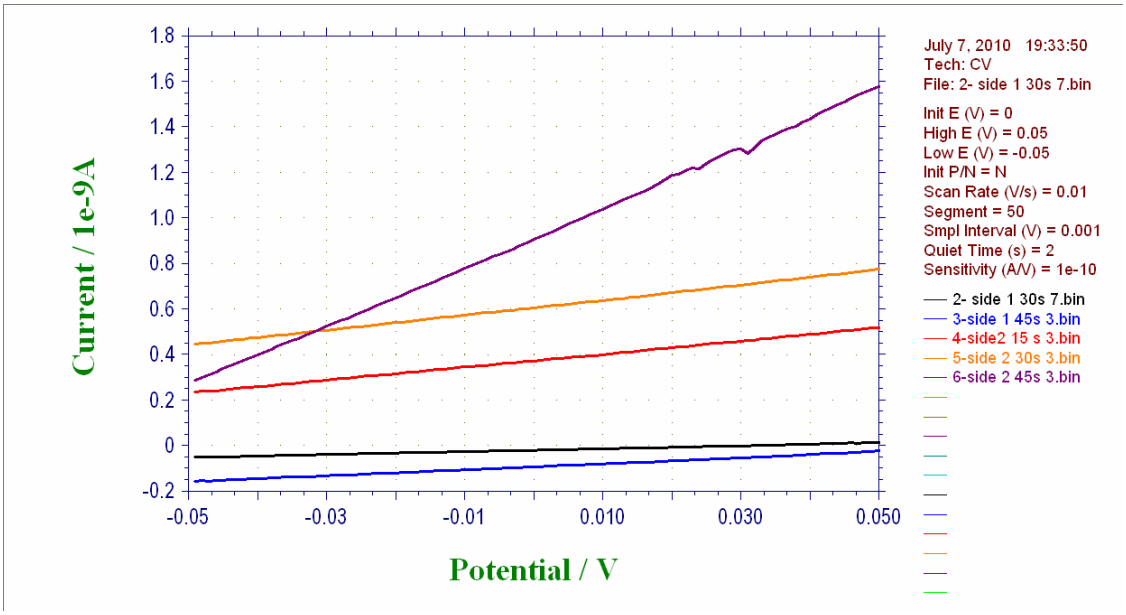

Figure S2. IV curves of the electrolyzed Au/Ag_2S NW/Au junction as a function of side and electrolysis time. Prior to any reduction, there were no significant residual electrical charges: an almost zero current was observed at zero bias. Upon reduction of the junction, the current becomes non zero at zero bias. This offset increases as the electrolysis time increases along with the conductance of the network. As the reduction proceeds, the presence of residual charges increases, suggesting that some Ag^+ ions are travelling through the nanowires, rather than being only reduced at the Ag^0/Ag_2S/electrolyte interface. When the junction is electrolysed on the other side of the junction, the off current direction switches. This is reversible, suggestive of a transport of Ag^+ ions that accumulate on the side where the electrolysis takes place. Since these residual charges fade with time, it is likely that this charging process is due to Ag^+ accumulation.