

Supplementary Information

Current self-complianced and self-rectifying resistive

switching in Ag-electroded single Na-doped ZnO nanowire

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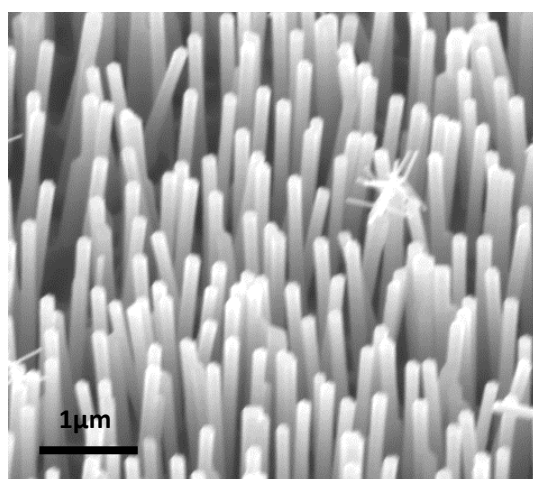


Fig.S1 Tilted SEM image of as-grown undoped ZnO nanowires. The nanowires tend to grow vertically on the substrate.

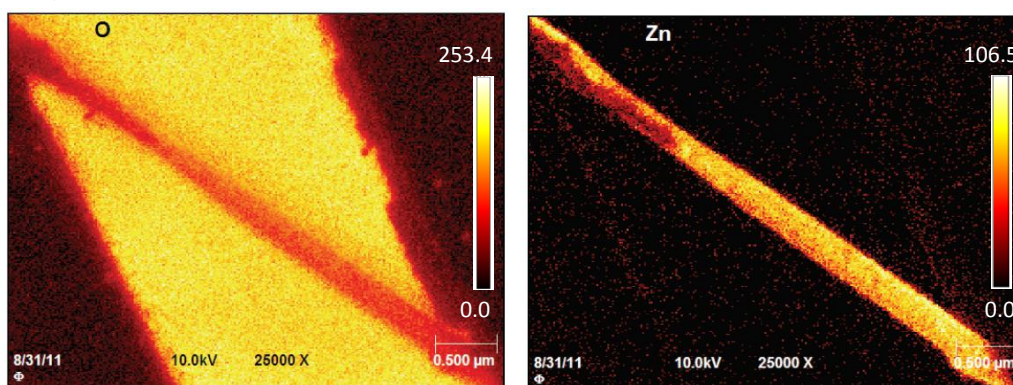


Fig.S2 AES O and Zn map of ZnO nanowire device after 1nm material on the surface was sputtered away to exclude the effect of possible contamination on mapping.

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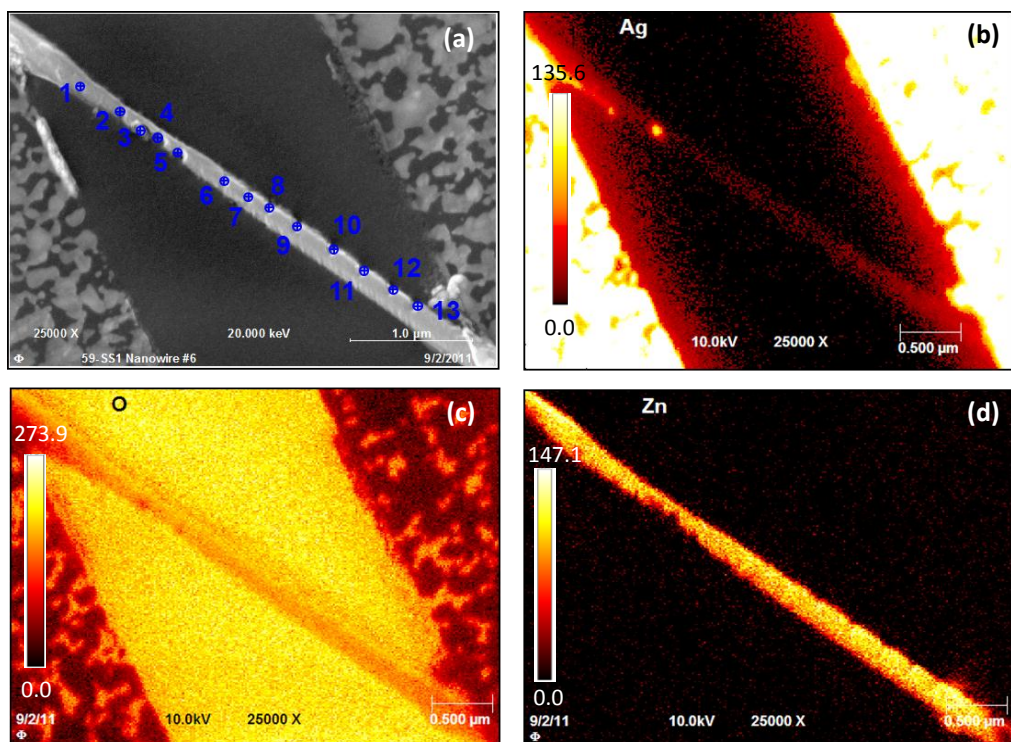


Fig.S3 (a) SEM image, (b)-(d) Ag, O and Zn map for the measured ZnO nanowire resistive switching device after 50nm material on the surface was sputtered away.

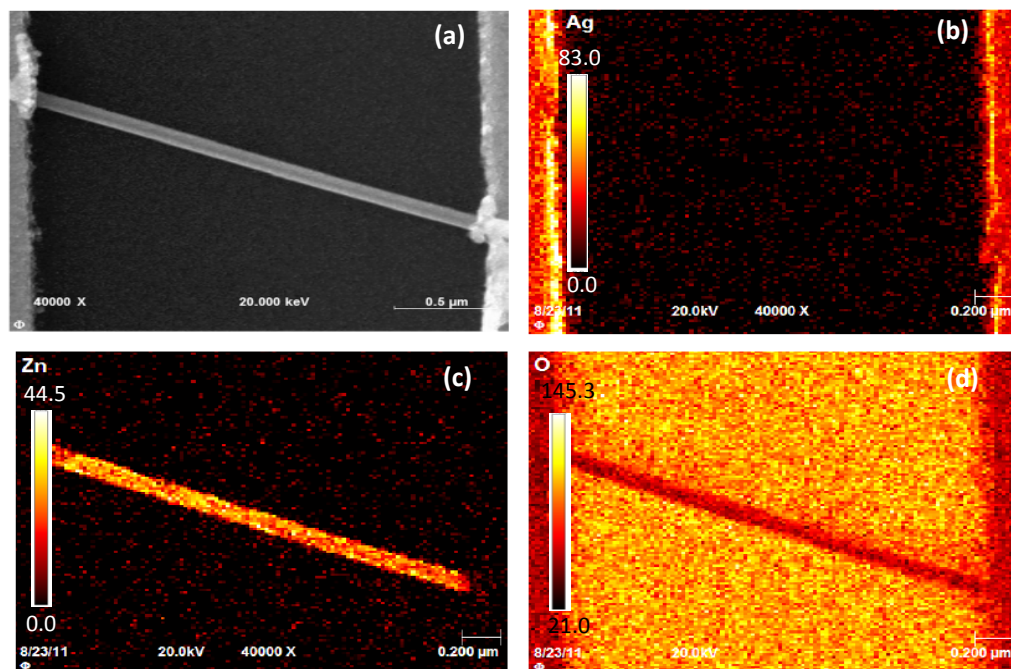


Fig.S4 (a) Typical SEM image and (b)-(d) Ag, Zn, O maps for ZnO nanowire without going through *I-V* characterizations.

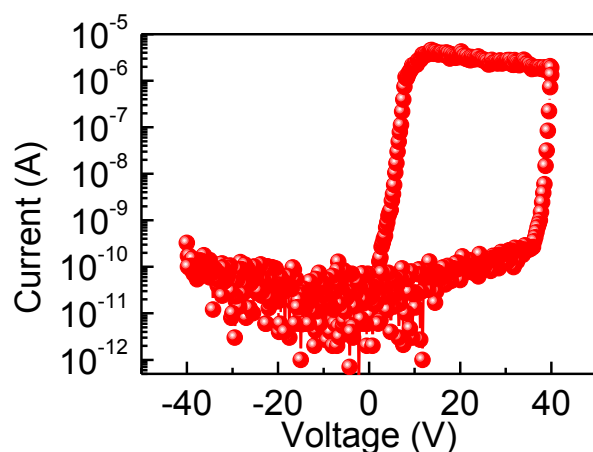


Fig.S5 I - V characteristics for Na-doped nanowire when the first voltage sweeping range is from 0V to -40V.

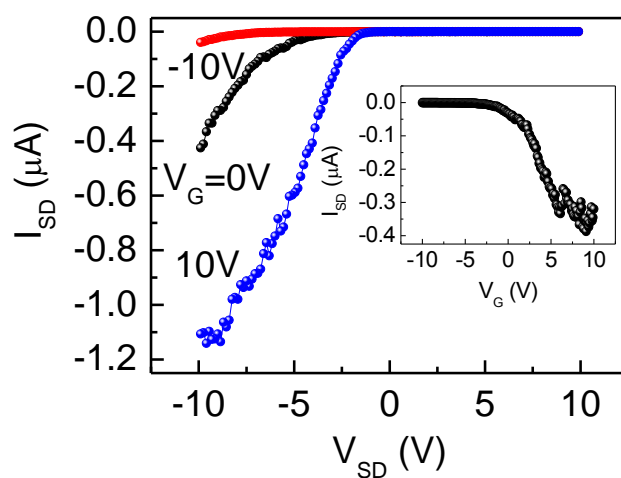


Fig.S6 I_D - V_D , inset: I_D - V_G results for the FET device fabricated with Na-doped ZnO nanowire, in which Al contact on the back of SiO_2/Si -substrate was utilized as gate.

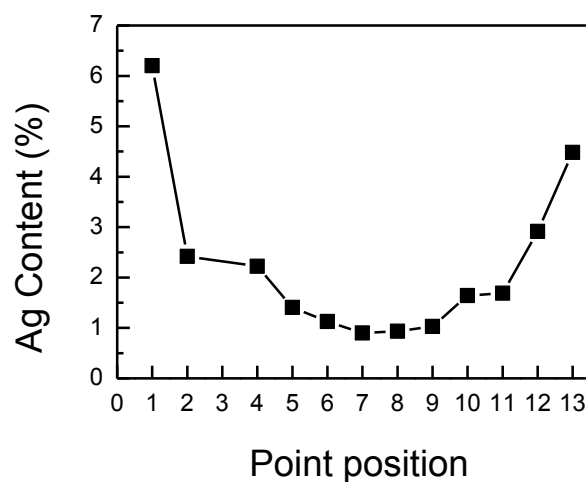


Fig.S7 Ag contents along the Na-doped nanowire after I - V characteristics with a layer of 50nm sputtered away. Part of these Ag atoms should be doped into ZnO nanowire as p-type dopant besides at the position of white spots.