

Supporting Information

A comparative transmission electron microscopy study of ZnO nanowire growth by a vapor-solid method and by thermal oxidation during Joule heating

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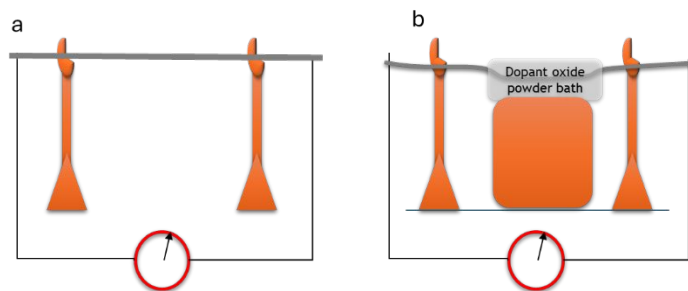


Figure S1. Experimental setup for Joule heating growth: a) for undoped metal oxide nanowires; b) for metal oxide nanowires doped with a second dopant oxide.

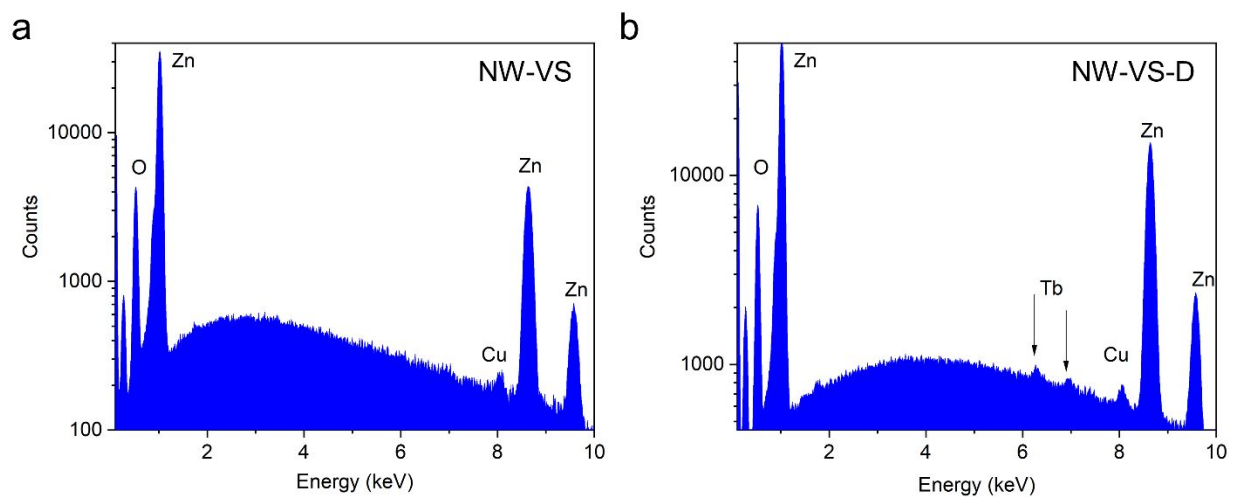


Figure S2. SEM-EDX spectra of nanowires from (a) NW-VS and from (b) NW-VS-D.

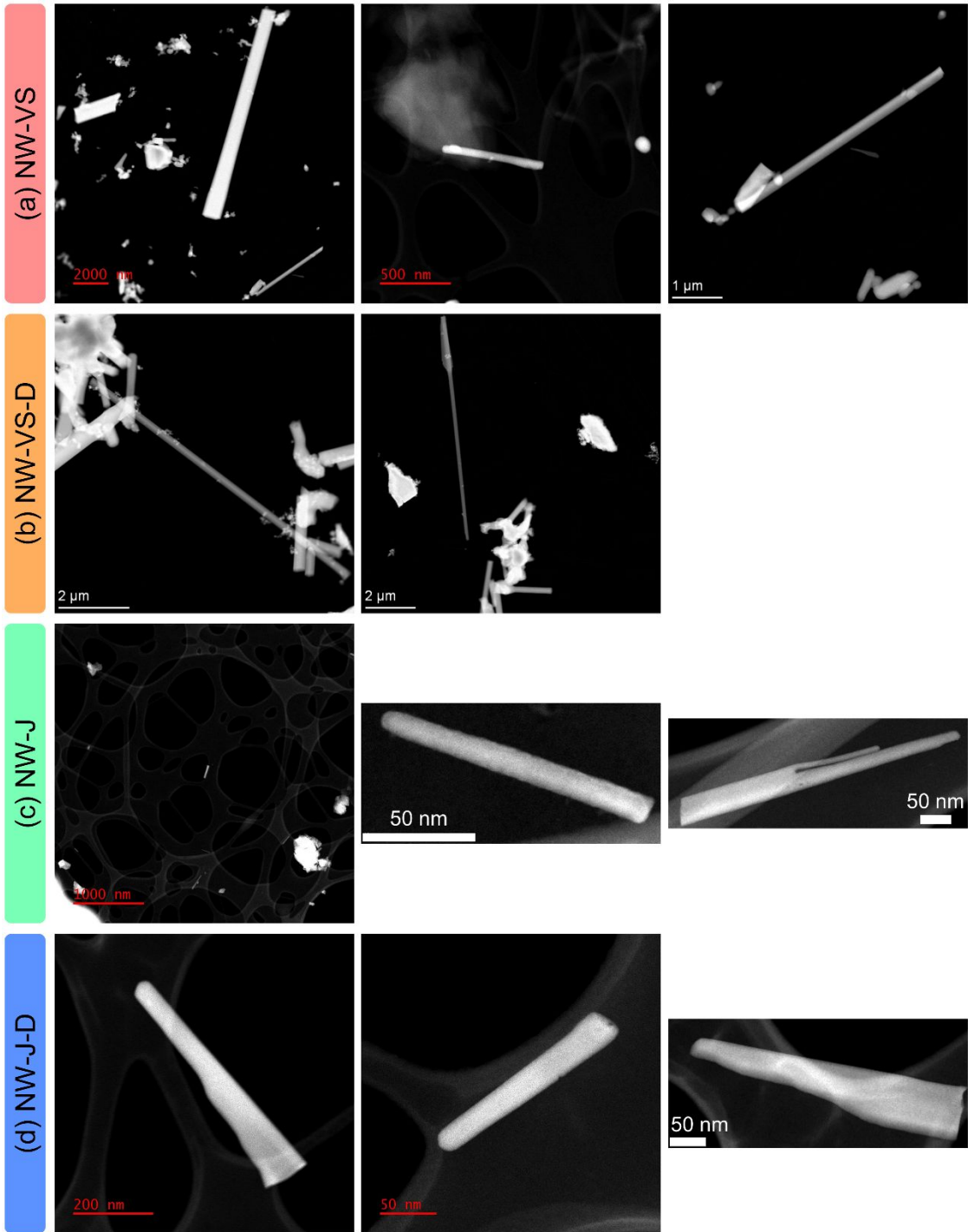


Figure S3. Morphologies of nanowires from (a) NW-VS, (b) NW-VS-D, (c) NW-J, and (d) NW-J-D recorded using HAADF-STEM imaging.

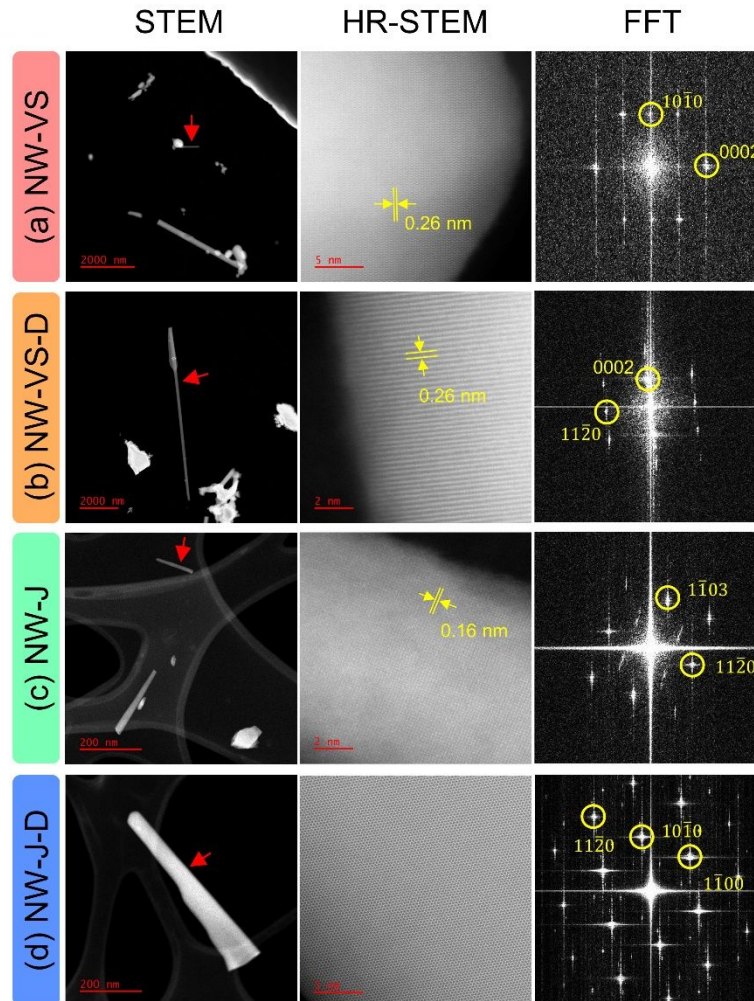


Figure S4. Crystal structures of nanowires from (a) NW-VS, (b) NW-VS-D, (c) NW-J, and (d) NW-J-D recorded using HAADF-STEM imaging and corresponding FFT patterns.

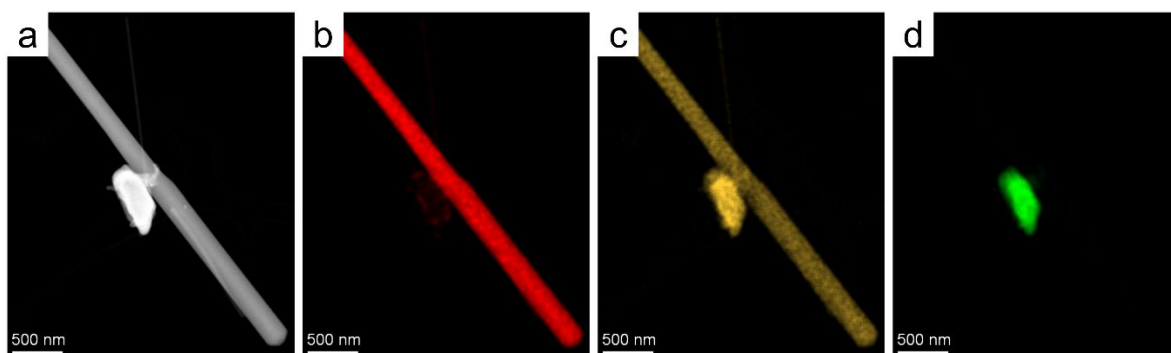


Figure S5. Elemental analysis of an individual NW-VS-D nanowire with a particle attached to its surface. (a) HAADF-STEM image of the nanowire. STEM-EDX elemental maps of (b) Zn, (c) O, and (d) Tb recorded from the nanowire in (a).

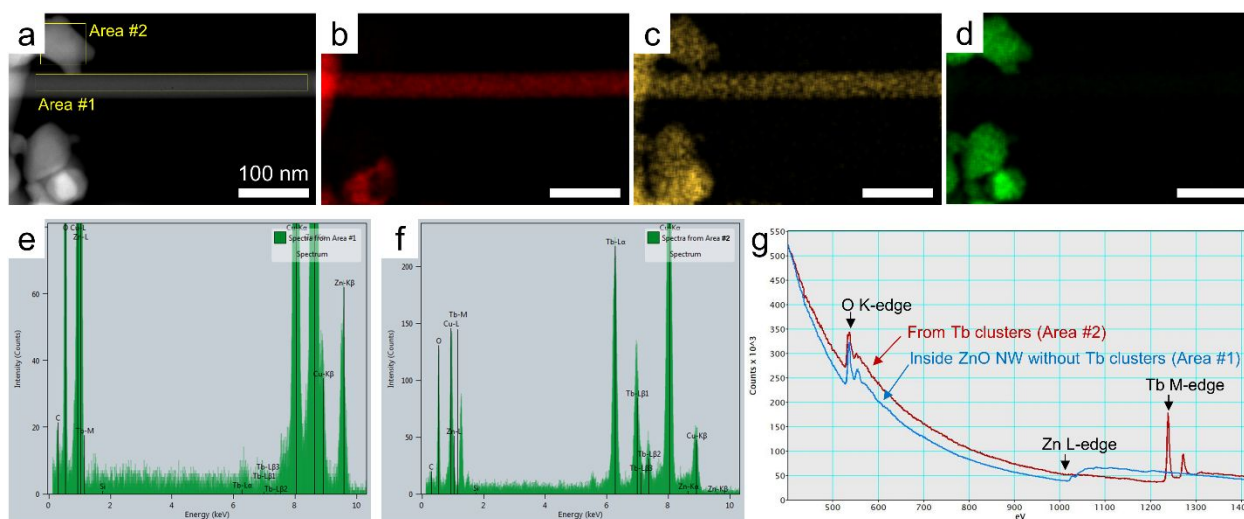


Figure S6. Elemental analysis of an individual NW-VS-D nanowire with particles attached to its surface. (a) HAADF-STEM image of the nanowire. STEM-EDX elemental maps of (b) Zn, (c) O,

and (d) Tb recorded from the nanowire in (a). EDX spectra from (e) the nanowire (Area #1) and from (f) the particle (Area #2). (g) EELS acquired from the nanowire (Area #1) and from the particle (Area #2).

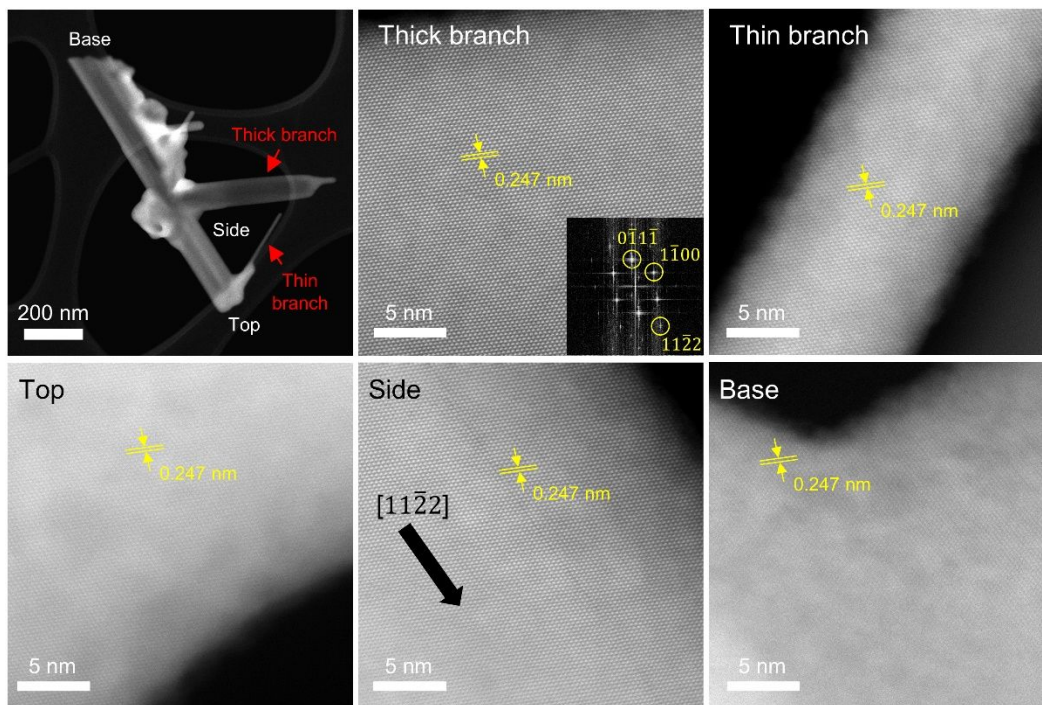


Figure S7. Branched nanowires of NW-J-D. HAADF-STEM images were recorded from different places of the branched nanowires. Crystallographic information of the nanowire can be found in the FFT pattern in the top middle figure. The growth direction of the main nanowire is indicated as an arrow in the bottom middle figure.

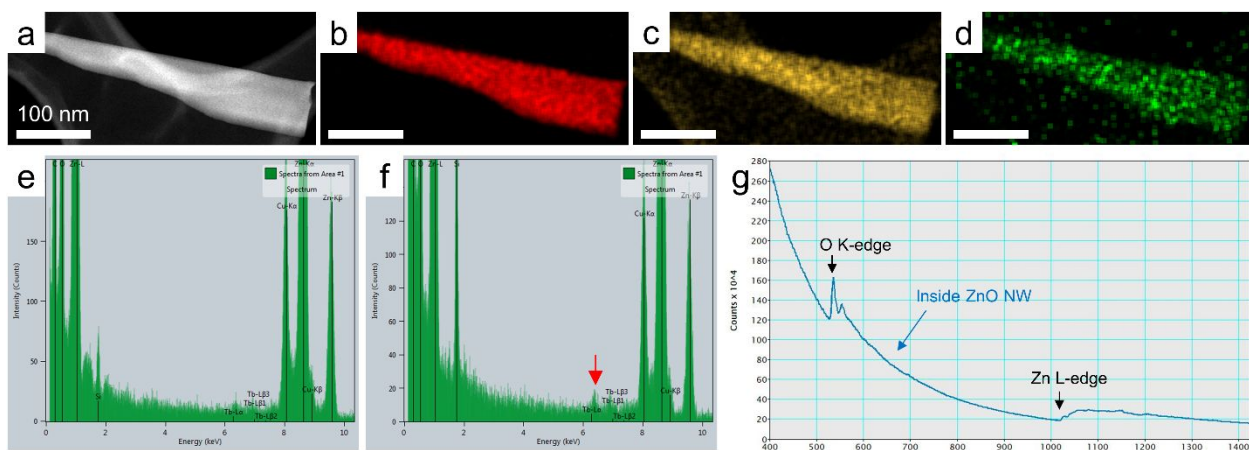


Figure S8. Elemental analysis of an individual NW-J-D nanowire. (a) HAADF-STEM image of the nanowire. STEM-EDX elemental maps of (b) Zn, (c) O, and (d) Tb recorded from the nanowire in (a). EDX spectra from (e) the nanowire in Figure 5a and from (f) the nanowire in (a). (g) EELS acquired from the nanowire in (a).