

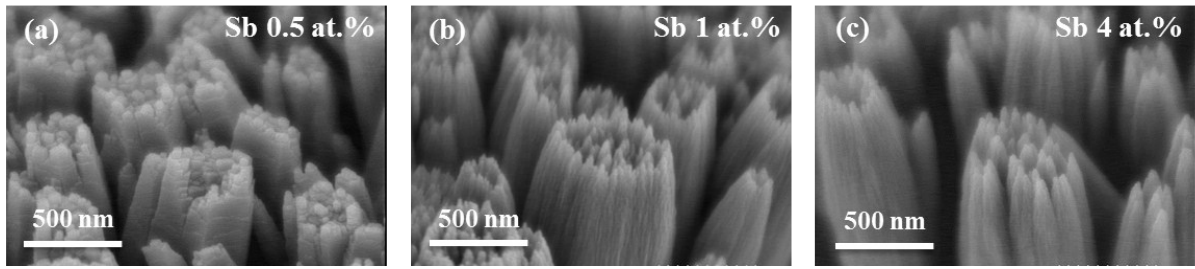
## **Supporting Information**

### **ZnO Homojunction-based Color-Switchable Bidirectional LEDs by Using Hydrothermal Growth Method**

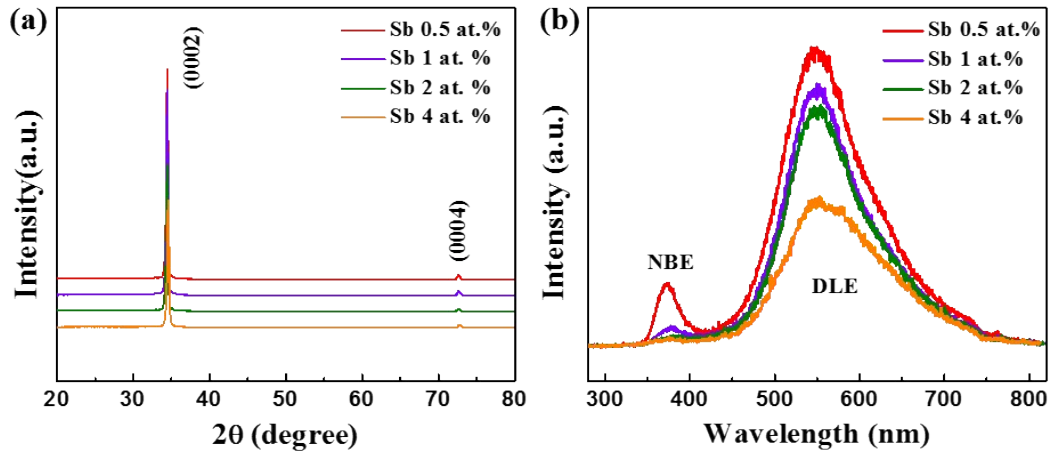
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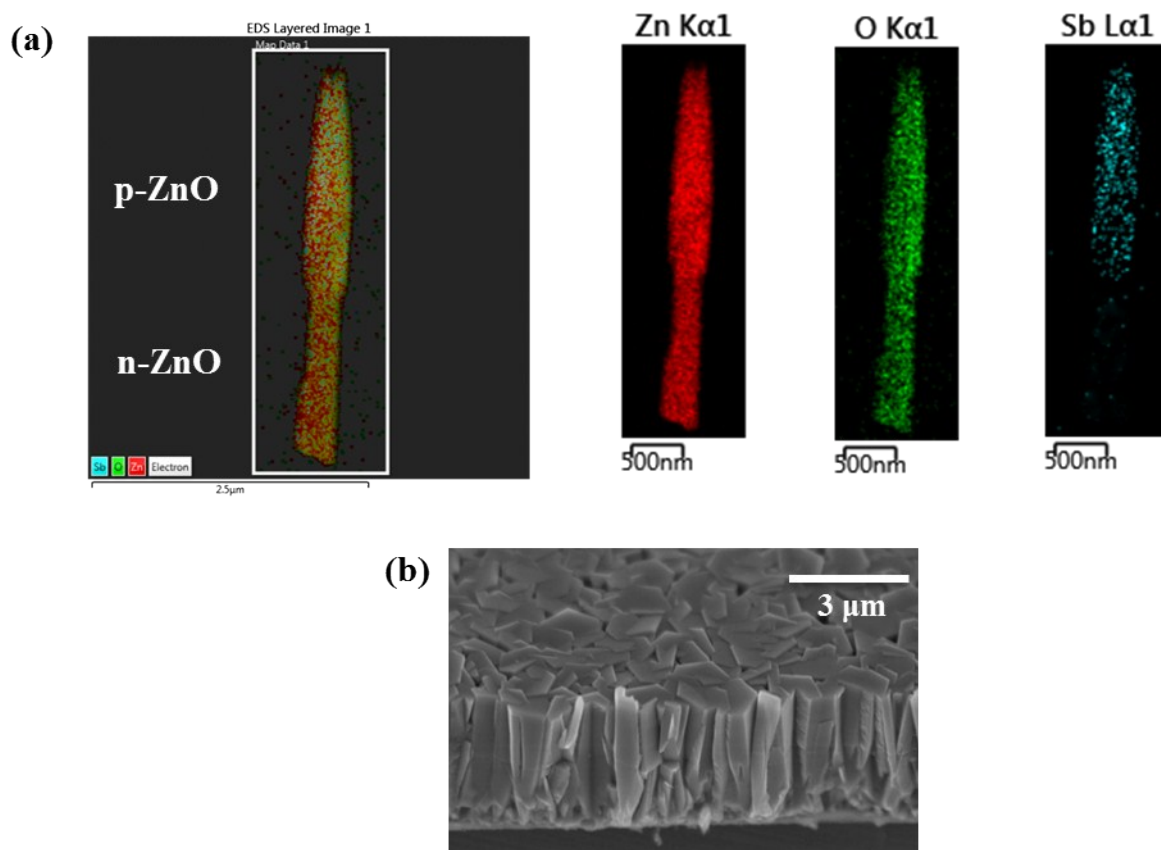
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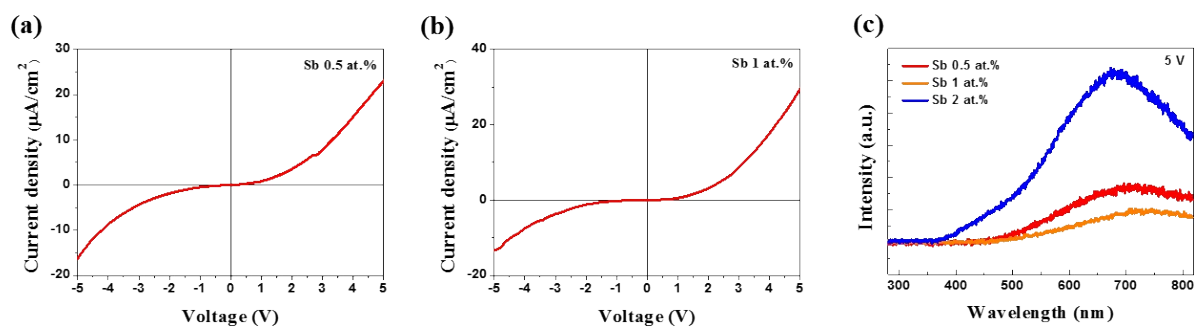
**Figure S1.** SEM images of p-type NRs doped with Sb concentration of (a) 0.5 at.%, (b) 1 at.%, and (c) 4 at.%.



**Figure S2.** (a) XRD data of the Sb-doped p-type ZnO NRs. (b) Room-temperature PL data of the Sb-doped p-type ZnO NRs.



**Figure S3.** (a) EDS mapping images for Zn, O, and Sb elements. (b) 45° angled-view SEM image of film-type 2 at.% Sb-doped ZnO NRs.



**Figure S4.** J-V characteristics of p-type NRs doped with Sb concentration of (a) 0.5 at.% and (b) 1 at.%. (c) EL characteristics of the devices fabricated with Sb-doped p-type NRs at a forward bias of 5 V.