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Aberration-corrected STEM of Cross-sectional View of Core-shell Nanowires[1] JIA XU, School for Engineering of Matter, Transport and Energy, Arizona State University, JINGYUE LIU, Departments of Physics, Arizona State University — Aberration-corrected scanning transmission electron microscopy (AC-STEM) technique was used to investigate the interfacial structures of core-shell nanowires (NWs). The ultramicrotome technique was used to prepare cross-sectional samples of ZnO-Bi_2O_3 core-shell NWs. Thin layers Bi_2O_3 epitaxially grew onto the six {11-20}but not the six {10-10}nanoscale facets. Such selective growth can be explained by the differences in the interfacial energy between the two oxide phases. AC-STEM further revealed the interfacial reconstruction of the Bi_2O_3 layers, a consequence of minimizing the interfacial energy and to make the epilayer growth of the Bi_2O_3 possible. A model was proposed to understand the growth processes of Bi-containing phases onto ZnO NWs.

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