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In-situ STM-TEM Studies of Individual GaN Nanowires MITRA TAHERI, Materials Science and Technology (Code 6360), Naval Research Laboratory, Washington, D.C. 20375, BLAKE SIMPKINS, Surface Chemistry (Code 6170), Naval Research Laboratory, Washington, D.C. 20375, PEHR PEHRSSON, Surface Chemistry (Code 6170), Naval Research Laboratory, Washington, D.C. 20375, RHONDA STROUD, Materials Science and Technology (Code 6360), Naval Research Laboratory, Washington, D.C. 20375 — The electronic and structural properties of individual GaN nanowires were studied using a scanning tunneling microscopy (STM) stage that operates inside a high-resolution transmission electron microscope (TEM) allowing simultaneous evaluation of electrical, compositional, and structural properties with nm-scale resolution. The GaN nanowires were prepared by atmospheric CVD on SiO_2/Si substrates. Catalyst metal deposition consisted of electron-beam lithography patterned Ni dots, enabling diameter- and position-controlled nanowire growth for device-compatible processing. A focused ion beam-scanning electron microscope with an in situ micromanipulator was used to extract single GaN nanowires from the substrate and attach them to copper TEM supports. Analysis of I-V characteristics of individual wires, and any correlation with microstructure, such as wire dimensions, growth habit and defect concentration will be presented.

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