

Abstract Submitted  
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**Cooperative epitaxial growth of rutile TiO<sub>2</sub> nanorods**<sup>1</sup> GUOBIN MA, MU WANG, NAI-BEN MING, National Laboratory of Solid State Microstructures, Department of Physics, Nanjing University, Nanjing 210093, P. R. China — One-dimensional (1-D) inorganic nanostructures are of both theoretical and technological interest, as these structures exhibit a wide range of electrical and optical properties that depend on both size and shape. Investigation of their microstructures is essential for understanding properties and growth mechanisms of 1-D nanocrystals, therefore it is an important issue. Taking rutile TiO<sub>2</sub> nanorods as a model material, here we report a new growth mechanism of nanorods. Rutile TiO<sub>2</sub> nanorods are prepared by a hydrothermal method. The nanorods, although having well-defined side surfaces, actually can be regarded as bunches of thinner nanowires with slight misorientations as indicated by high-resolution transmission electron microscopy analysis. We propose a growth mechanism, the cooperative epitaxial growth method, to explain this formation phenomenon. Nanorods of various materials reported in literatures also imply these growth features, suggesting that they should be governed by the same mechanism.

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