

Abstract Submitted
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Pressure-induced amorphization and polyamorphism in TiO₂-B nanoribbons QUANJUN LI — The phase transitions of TiO₂-B nanoribbons were investigated with synchrotron X-ray diffraction and the Raman spectroscopy. Our results have shown PIA occurred in TiO₂-B nanoribbons upon compression, resulting in a high density amorphous (HDA) form related to the baddeleyite structure. Upon decompression, the HDA form transforms to a low density amorphous (LDA) form while the samples still maintain their pristine nanoribbon shape. HRTEM image reveals that the LDA phase has an α -PbO₂ structure with short range order. We propose a homogeneous nucleation mechanism to explain the PIA for the TiO₂-B nanoribbons. Our study demonstrates that PIA and polyamorphism occurred in the one-dimensional (1D) TiO₂ nanomaterials for the first time and provides a new method for preparing 1D amorphous nanomaterials from crystalline nanomaterials.

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