A STUDY OF THE CURVATURE OF A THICK ALN FILM GROWN ON A TRENCH-PATTERNED α-Al_2O_3 TEMPLATE USING X-RAY DIFFRACTION

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Abstract:

In this article a method using X-ray diffraction for determining the crystallographic curvature of a thick AIN crystalline film epitaxially grow on a periodically trench-patterned α-Al_2O_3 template by the hydride vapor phase epitaxy method was studied. A series of X-ray rocking curve measurements for AIN 0002 reflection was taken at different positions across the surface of the thick AIN epitaxial film along the [1100] direction. We introduced a model for determining the crystallographic curvature and the curvature redius from X-ray diffraction results. The results_clearly demonstrate that the crystallographic curvature of the film is convex along the [1100] direction and the radius of crystallographic curvature of the thick AIN film is estimated to be 3.1 m.

Key words: Curvature; X-ray diffraction; AIN film; Trench-patterned template; Strain.