

Abstract Submitted
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In-situ X-ray Studies of MOCVD Growth of InN FAN JIANG, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, A. MUNKHOLM, C.D. DIMITROPOULOS, Philips Lumileds Lighting Company, San Jose, CA 95131, R.-V. WANG, S.K. STREIFFER, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL 60439, G.B. STEPHENSON, P.H. FUOSS, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, K. LATIFI, CAROL THOMPSON, Physics Department, Northern Illinois University, DeKalb, IL 60115 — One of the fundamental issues in the continued development of III-nitride semiconductor alloys is to understand incorporation of indium. Our approach is to use real-time x-ray scattering and fluorescence as *in situ* probes during growth by MOCVD. We observe the equilibrium condensation boundaries for elemental In and InN as a function of temperature and trimethylindium supply, which allow us to determine the effective activities of In and N at the sample surface. We find that the partial pressures of both hydrogen and ammonia in the ambient have strong effects on the activities. We also observe strong effects of the substrate on condensation, including an oscillatory regime, indicating that surface reactions are important. Work supported by the U.S. Dept. of Energy contract DE-AC02-06CH11357.

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