Abstract Template

Atomistic Processes of GaN Metal Organic Vapor Phase Epitaxy (MOVPE)

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Abstract (not more than 300 words)

GaN has attract a great attention because it is the key material of future power devices as well as present optoelectronics devices. To achieve recent requirement of future power devices, epitaxial growth of high quality GaN is necessary, and atomistic understanding of GaN MOVPE growth is inevitable. In this presentation, we clarify the gas phase reactions of GaN MOVPE by using the first principles calculations. Our calculations indicate that TMG (trimethylgallium, $Ga(CH_3)_3$) decomposes into GaH_3 by removing methyl groups. This decomposition reaction includes two gas phase reactions of TMG + NH_3 → $DMGNH_2$ + CH_4 and $DMGNH_2$ + H_2 → DMGH + NH_3. This two step decomposition of TMG is the key atomistic mechanism of gas phase reactions of GaN MOVPE.

Keywords—*GaN, MOVPE, First Principles Calculation, Gas Phase Reaction*

Professional Biography (100-150 words)

Dr. Kenji Shiraishi haas completed his PhD from the University of Tokyo, Japan in 1988 and worked for NTT basic research laboratories, Japan from 1988 to 2000. From 2001-2013, he worked for University of Tsukuba. From 2013, he moved to Nagoya University. He is now a professor of Nagoya university. He has published more than 200 papers in reputed journals.



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