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Gas phase optical emission spectroscopy during remote plasma chemical vapour deposition of GaN and relation to growth dynamics[1]
CORMAC CORR, The Australian National University, Australia, ROBERT CARMAN, Macquarie University, Australia, ROD BOSWELL, The Australian National University, Australia, CONOR MARTIN, MARIE WINTREBERT-FOUQUET, SATYA BARIK, Bluglass Ltd, Australia — The remote plasma chemical vapour deposition (RPCVD) process being developed by the Australian company BluGlass offers several potential advantages over existing deposition techniques used to produce LED's. These include lower substrate temperature and a clean nitrogen gas as the N-atom source. In this work a nitrogen plasma discharge is created upstream of the growth region to provide the nitrogen precursors. Excited species from the plasma flow downstream interacting with gallium precursors in the deposition chamber. Optical emission spectroscopy is employed to correlate plasma species in the source and afterglow region with GaN film growth properties. In particular, the presence of hydrogen in the plasma gas stream significantly influences the excited plasma species, GaN layer growth dynamics and surface morphology of the films.

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