



	Experiment title: Local study of the incoherent alloy InGaN in QuantumWells and NanoWires	Experiment number: MA-2152
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Report:

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InGaN nanowires with high InN molar fraction: growth, structural and optical properties

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Abstract

The structural and optical properties of axial GaN/ InGaN/ GaN nanowire heterostructures with high InN molar fractions grown by molecular beam epitaxy have been studied at the nanoscale by a combination of electron microscopy, extended x-ray absorption fine structure and nanocathodoluminescence techniques. InN molar fractions up to 50% have been successfully incorporated without extended defects, as evidence of nanowire potentialities for practical device realisation in such a composition range. Taking advantage of the N-polarity of the self-nucleated GaN NWs grown by molecular beam epitaxy on Si(111), the N-polar InGaN stability temperature diagram has been experimentally determined and found to extend to a higher temperature than its metal-polar counterpart. Furthermore, annealing of GaN-capped InGaN NWs up to 800 ° C has been found to result in a 20 times increase of photoluminescence intensity, which is assigned to point defect curing.