

Supplementary Information

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TITLE: Synthesis, photoluminescence and field emission properties of well aligned/ well patterned conical shape GaN nano-rods.

Field emission measurements of poor patterned GaN nano-rods synthesized at 1000°C has also been performed in a vacuum chamber with a pressure of 1.2×10^{-6} Pa at room temperature. A rod-like stainless steel probe (1mm in diameter) of 0.78 mm^2 in area has been used as an anode and the product used as cathode. The spacing between these two electrodes was $200 \mu\text{m}$. Fig. S1 depicts the exponential dependence of the emission current density (J) on the applied electric field (E).

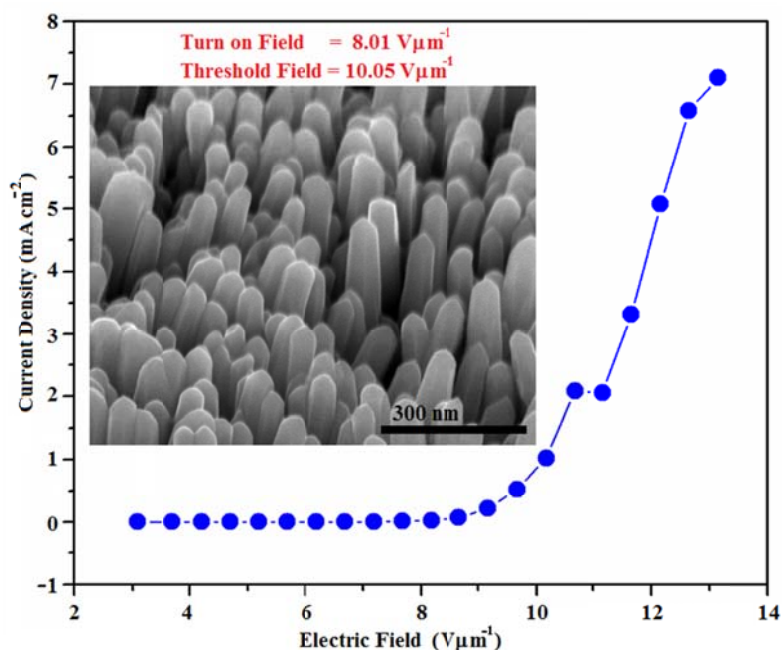


Fig. S1: shows the field emission properties (J-E curve) of non-aligned GaN nano-rods synthesized at 1000 °C. (Inset is the SEM of poor patterned/ non-aligned GaN nanorods)

The turn-on field of $8.01 \text{ V}\mu\text{m}^{-1}$ and threshold field of $10.05 \text{ V}\mu\text{m}^{-1}$ has been obtained for poor patterned /non-aligned nano-rods synthesized at $1000 \text{ }^\circ\text{C}$ as shown in Fig. S1. Since the nanorods synthesized at $1000 \text{ }^\circ\text{C}$ are non-aligned and their tip is also not sharp, so their turn on and threshold value is greater than well-aligned GaN nanorods prepared at $1100 \text{ }^\circ\text{C}$ and $1200 \text{ }^\circ\text{C}$. From the high turn on values of poor patterned GaN nano-rods it can be concluded that low turn on value is related to the well aligned growth of GaN nanorods.