

Abstract Submitted
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Synthesis and luminescence properties of Erbium doped Aluminum Nitride Nanoparticles SNEHA PANDYA, MARTIN KORDESCH, Ohio University — Wide band semiconductor nitrides have been found to be good hosts for rare earth elements and have potential applications such as optical amplifiers, light emitting sources, detectors, and for optical communications. Erbium doped Aluminum Nitride (AlN:Er) nanoparticles were synthesized using Inert Gas Condensation technique (IGC). AlN:Er particles were imaged using TEM and SEM and were observed to be of the order of 50-150nm. They were found to have two distinct structures. In one case, closed particles made up of several smaller particles with distinct grains were found, in the other case particles were brush-like structures made from hundreds of smaller crystallites. Their Photoluminescence and Cathodoluminescence properties were studied. The emission peaks of Er⁺³ ions lie in the visible region and are observed to be broadened as compared to AlN:Er thin films. This broadening of the peak is attributed to the reduced dimension. The effect of heating on the luminescence of the particles was also studied and it was found that the optical spectra of the heated particles are comparatively sharp with well-resolved peaks.

Sneha Pandya
Ohio University

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