

TAPERED HEAD FACETS OF ZINC OXIDE NANORODS

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ABSTRACT

Tapered head facets of ZnO nanorods are unique morphologies that offer potential applications in photoconductivity, chemical sensing, UV photodetection and optoelectronic display. Enhanced photoresponse could be due to large concentrations of intrinsic structural defects such as oxygen vacancies and zinc interstitials that are detected from visible PL emission. From our CFCOM gas synthesis technique, we have grown ZnO nanorods with tapered head facets at a rapid rate of 100nm/s in just 15s whereby the quenching stage could be crucial in retaining the tapered heads. Unstable tapered facets such as planes of { 2025 }, { 1013 }, { 1014 } and { 1015 } could be a contributing factor in the rapid growth rate of CFCOM ZnO rods due to their faster growth rates and high surface energies. Simulations of ZnO heads that we report can be used as a guideline for identification of tapered tips of ZnO nanostructures.

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