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Thin Film and Free Crystallite Formation of ZnO Nanorods from Solution Under Extreme Crystallization Conditions ANAMIKA GOPAL, CHELSI KWITOSKI, MARIAN TZOLOV, Lock Haven University, Pennsylvania — ZnO nanorods, grown by the established Hexamethylenetetramine (HMTA) process, through the reaction of Zinc Nitrate with HMTA, are investigated. The nanorod morphology dependence on temperature, initial solution concentration and crystallization time is studied. Crystal growth on glass and ITO substrates and free crystallite precipitation in solution are characterized by SEM and EDX. Low concentrations and temperatures are investigated for production of rod-clusters with a high aspect ratio and low surface nucleation density. Such morphology is expected to enhance charge transport while preserving light transmissivity, for use in efficient ZnO photovoltaic devices. Free crystallite formation in solution with varied initial parameters is characterized by a time dependent light scattering study, supported by SEM and EDX data. A high aspect ratio of solitary, free crystallites is sought, which we believe would be most effective in solution processed, concentration gradient solar cells.

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