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Experimental Investigations on the Thermal Diffusion Characteristics and Photoluminescence in Multiphase Micro Fluids Containing ZnO Micro Tubes and Fluorescein Dye*

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Scattering of light by disordered structures is normally detrimental to their applicability in many optoelectronic devices. However, some micro and nanostructures are useful in enhancing several optical and thermal properties like emission, heat diffusion etc. For this purpose, we have optimized the low temperature hydrothermal growth method for the ZnO micro tubes which leads to the growth of ZnO as mono dispersed micro tubes. Further, these samples were used to enhance the fluorescence efficiency of disordered media consisting of micro tubes of ZnO and fluorescein dye and to optimize the thermal diffusion of the mixture which will help us optimize the composition of these microscopic inclusions in designing a random lasing medium. Dual beam thermal lens method was used for this purpose.

Keywords: thermal lens, thermal fluidics, thermal diffusivity, ZnO micro tubes, fluorescein.

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