

Erbium-doped transparent glass ceramic optical fibres: Characterization using mass spectroscopy and molecular dynamics modeling

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R�sum� en anglais	Rare earth (RE) doped silica-based optical fibres with transparent glass ceramic (TGC) core were fabricated through the well-known modified chemical vapor deposition (MCVD) process without going through the commonly used stage of post-cerammng. The main characteristics of the RE-doped dielectric nanoparticles (DNP), their density and mean diameter in thefibres are dictated by various parameters. This paper reports on progresses in the fine characterization of the nanopaticles, particularly their dimensions and composition, using nanosclae mass spectroscopy and molecular dynamics modeling, and alteration of the spectroscopic properties of the erbium ions embedded within the phospho-silicate DNP. These results permit to get more insight into the complex process of the DNP self-nucleation and growth during the fibre fabrication process. This fabrication route could have important potentials in improving rare-earth-doped fibre amplifiers and laser sources
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