

Rare-earth doped oxide nanoparticles in optical fibers

W. Blanc, M. Vermillac, H. Fneich, M. Cabié, C. Kucera, D. Borschneck, F. Peters, P. Vennéguès, T. Neisius, S. Chaussedent, D.R. Neuville, A. Mehdi, J. Ballato
Institut de Physique de Nice, Université Côte d'Azur, CNRS UM 7010, Parc Valrose, 06108 Nice
Cedex 2, France

The success of optical fibers based on silica glass are many: transmission fibers and fiber amplifiers for telecommunications, high-power fiber lasers, sensors, ... These key applications rely on the qualities of silica glass: mechanical and chemical stability, high optical damage threshold, low cost, ... However, this glass has certain characteristics (high phonon energy, low rare-earth solubility, ...) which may make it less efficient compared to other types of glass. To overcome these limitations, a new family of optical fibers containing rare-earth doped oxide nanoparticles are developed. Thanks to this approach, the luminescent properties can be engineered through the composition of the nanoparticles. During this talk, we will discuss the formation of nanoparticles and the engineering of the rare-earth ions luminescent properties. These results clearly offer new possibilities for the control of the luminescent properties and the development of optical fibers with *augmented* properties.