Optical and physical properties of Er\(^{3+}\)-Yb\(^{3+}\) co-doped tellurite fibers (Conference Paper)

Narro-García, R.\(^a\), Chillcce, E.F.\(^a\), Miranda, A.R.\(^a\), Giehl, J.M.\(^a\), Barbosa, L.C.\(^a\), Rodríguez, E.\(^b\), Arronte, M.\(^b\)

\(^a\) Instituto de Física Gleb Wataghin, Universidade Estadual de Campinas-UNICAMP, Campinas, SP 13083-970, Brazil
\(^b\) Centro de Investigación en Ciencia Aplicada Y Tecnología Avanzada Unidad Altamira, Tamaulipas 89600, Mexico

Abstract

In this work we present results of physical and optical properties of Er\(^{3+}\)-Yb\(^{3+}\) co-doped tellurite glasses and fibers. The Double Clad Tellurite Fibers (DCTFs) are based on glasses with the composition: TeO\(_2\)-WO\(_3\)-Nb\(_2\)O\(_5\)-Na\(_2\)O-Al\(_2\)O\(_3\)-Er\(_2\)O\(_3\)-Yb\(_2\)O\(_3\). The DCTFs were fabricated by using the rod-in-tube technique and a Heathway drawing tower. The optical absorption spectra (ranging from 350 to 1750 nm) of these fibers were measured using an Optical Spectrum Analyzer (OSA). The emission spectra, around 1550 nm band, of these fibers (lengths varying from 1 to 60 cm) were obtained by using a 980nm diode laser pump. The optimal Amplified Spontaneous Emission (ASE) spectra were observed for fiber lengths ranging from 2 to 6 cm. The Er\(^{3+}\)/Yb\(^{3+}\) co-doped DCTFs show an efficient up-conversion process in comparison with the Er\(^{3+}\)-doped DCTF. © 2011 Copyright Society of Photo-Optical Instrumentation Engineers (SPIE).

Proceedings of SPIE - The International Society for Optical Engineering

Volume 8120, 2011, Article number812005
Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications V; San Diego, CA; United States; 21 August 2011 through 22 August 2011; Code 86810