

## Sol-Gel Erbium-Doped Silica-Hafnia Planar Waveguides

**Authors :** Mustapha El Mataouy, Abellatif Aaliti, Mouhamed Khaddor

**Abstract :** Erbium activated silica-hafnia planar waveguides have been prepared by sol-gel route. The films were deposited on vitreous silica substrates using dip-coating technique. The parameters of preparation have been chosen to optimize the waveguides for operation in the near infrared (NIR) region, and to increase the luminescence efficiency of the metastable  $4I_{13/2}$  state of Erbium ions. The waveguides properties were determined by m-lines spectroscopy, loss measurements. Waveguide Raman and luminescence spectroscopy were used to obtain information about the structure of the prepared films and about the dynamical process related to the emission in the C telecom band (1530nm-1565nm) of the Erbium ions. The results are discussed with the aim of comparing the structural and optical properties of Erbium activated silica-hafnia planar waveguides with different molar ratio of Si / Hf.

**Keywords :** erbium, optical amplifiers, silica-hafnia, sol-gel, waveguide

**Conference Title :** ICMS 2016 : International Conference on Material Strength

**Conference Location :** London, United Kingdom

**Conference Dates :** December 15-16, 2016