

Optical properties of GeO₂-doped silica preform from absorption and vibrational spectroscopy

ABSTRACT

Germanium doped silica optical preform fabricated using standard MCVD has been studied in terms of the effect of germanium-oxygen deficient defect using optical characterization techniques to investigate the effect of preform process temperature. The preforms are fabricated using standard MCVD process using SiCl₄ and GeCl₄ vapor precursor and their collapse temperature varies between 2100°C and 2200 °C. The absorption spectra of the preform at UV region is used to identify the Ge concentrations in the sample and the background loss. From the absorption result, two peaks can be observed at 5.1eV and 6.7eV. By using Raman and Photoluminescence spectroscopy, the effect of the temperature to the Ge concentration can also be quantify.

Keyword: Fiber Bragg grating; MCVD; Photosensitivity; Oxygen deficient defect