

Glass pairs for photosensitive optical fibers and fiber lasers

L. Glebova, K. Al Yahyaei, R. Amezcua-Correa, E. Antonio-Lopez, D. Ott, I. Divliansky, H. Mingareev, A. Schülzgen, L. Glebov

¹ Optigrate Corp., Oviedo, FL, USA

² CREOL, University of Central Florida, Orlando, FL, USA

³ AMPAC, University of Central Florida, Orlando, FL, USA

E-mail: lglebova@optigrate.com

The Photo-Thermo-Refractive (PTR) glass is an optical material widely used for the volume Bragg gratings recording. As it was shown in our recent work, this glass can be successfully used for the coreless fiber drawing with subsequent recording and development of holographic Bragg gratings in the fiber. This work addresses development of pairs of glasses for a core and a cladding which are compatible for both technological procedures – the fiber drawing and the grating recording. It was found that a preform made from the PTR glass, which is apt to crystallization at high temperature, can be drawn to fibers with different diameter without any traces of the crystal growth. Then, in spite of losing fluorine from the surface, the PTR glass fiber retains its photosensitive properties enabling grating recording. Moreover, the Bragg grating, recorded in such a fiber, can withstand aging at temperatures exceeding T_g of this glass.