

2354

**Abstract for 7<sup>th</sup> Otto Schott Colloquium, Jena, July 7-10, 2002**

**Novel photosensitive glasses**

Heike Ebendorff-Heidepriem, Christos Riziotis and Elisabeth Taylor

*Optoelectronics Research Centre, University of Southampton, SO17 1BJ, U.K.*

In the last decade, photosensitivity of glass fibers and waveguides has received much attraction. A high photosensitivity enables the imprinting of special structures into glasses by lasers as a result of refractive index changes. This phenomenon is used to write directly Bragg gratings and waveguides into glasses, which has an enormous impact on the manufacturing, tailoring and efficiency of optical devices. Photosensitivity of glasses is well known and has been widely studied in germanium-doped silica fibers. Recently, the study of the photosensitivity of other optical glasses and especially the search for dopants increasing the photosensitivity is of great practical importance.

Fluoride phosphate and phosphate glasses are attractive materials for photonic devices. Their photosensitivity has been only slightly studied. Recently, they received much attention due to their athermal properties. The impact of several dopants and glass melting conditions on the photosensitivity is of special interest. Different base glasses doped with europium, cerium and lead ions were melted under oxidizing and reducing conditions. The photosensitivity is examined by writing of waveguides and gratings as well as by direct laser illumination. Laser-induced changes in the refractive index is compared with those in optical absorption. Furthermore, the dynamics and thermal behaviour of photosensitivity is studied using different laser powers (cw, pulsed), exposure times and isochronal annealing.