

NANOTEK & EXPO

December 05-07, 2016 Phoenix, USA

Chalcogenide glasses; their micro/nanostructuring, examples of applications

Miroslav Vlcek

University of Pardubice, Czech Republic

Chalcogenide Glasses (CHGs) are very promising materials for many photonic applications due to their unique properties and functionalities. They possess for example wide IR transmission window, high non-linearity of optical properties, high refractive index and many of them are sensitive to bandgap or UV light, or electron and ion beams. In addition, their composition can be locally modified by exploiting radiation induced diffusion and dissolution of suitable metals (e.g., Ag, Zn). All these structural/compositional changes result in selective wet or dry etching which allows CHGs surface structuring on micro and/or even nanoscale. Lower rigidity and lower softening temperatures in comparison with classical oxide glasses allow their surface to be corrugated by direct laser writing method or by embossing. In this paper, we review methods of CHGs micro and nanostructuring and demonstrate applications of CHGs thin films prepared by vacuum based or solution based deposition techniques (such as spin-coating) in high-resolution UV, electron lithography and as materials for fabrication of diffractive elements for VIS and IR spectral region.

Biography

Miroslav Vlcek completed his PhD from Institute of Chemical Technology, Pardubice, Czechoslovakia in 1987. Since 1998, he has been an Associate Professor and since 2005, he has been a Professor at University of Pardubice, Czech Republic. In 2003-2004, he was working as Visiting Professor at Lehigh University, PA, USA. Presently, he is the Director of Center of Materials and Nanotechnologies at University of Pardubice. He has published more than 120 papers. His research is focused on "Photoinduced structural changes in chalcogenide glasses and application of this phenomena in fields such as photonics, diffractive optics and high resolution lithography".

Miroslav.Vlcek@upce.cz

Notes: