conferenceseries.com SciTechnol

A L Stepanov, J Nanomater Mol Nanotechnol 2017, 6:7(Suppl)
DOI: 10.4172/2324-8777-C1-017

2nd World Congress and Expo on

GRAPHENE & 2D MATERIALS

November 06-07, 2017 | Frankfurt, Germany

A L Stepanov

1.Kazan E K Zavoisky Physical-Technical Institute – RAS,Kazan Federal University, Russia

Surface periodic micro-nanosctructuring of diamond by boron and silver ion implantation

Modern tasks of integrated optics require the use of special new materials and the development of technologies for productions of components and devices based on them. One of the specific areas is diamond optics. The interest in diamond is explained due to its radiation resistance and high thermal conductivity. Diamond Optical Elements (DOE) have a wide window transparency from 0.2 to 5 m. Diamond fills well at very high temperature and in aggressive chemical environments. In practice, the diamonds are used for production various diffractive optical elements as gratings, focusers, equalizers, etc. DOE can be applied with the high-power beam of the CO2-laser until the power density of the illumination up to 20 kW/cm2, to create a photonic crystal resonators to implement quantum information storage devices and to control the radiation fluxes in the X-ray optics, for example, using diamond Bragg mirror with a reflectivity of 100% etc. The present study relates to new method for a fabrication of diffractive optical elements with diamond surface nanostructuring. The diffraction grating was obtained on diamond by implantation of boron or silver ions through a mask. In the process of implantation in the unmasked areas of the irradiated diamond was graphitized and nanostructured. The formation of periodic diffraction microstructures on the diamond surface was monitored by optical, electron and atomic force microscopy.

Biography

A Stepanov is with Kazan Physical-Technical Institute, Russian Academy of Sciences since 1992. During 1997-1999, he was a Research Fellow at the Sussex University, UK (the Royal Society/NATO). From 1999 to 2003, he was a Research Fellow of the RWTH in Germany (the Alexander von Humboldt Foundation). During 2003-2004, he was granted Lise Meitner Fellowship (Austrian Scientific Society) in Karl-Franzens-University in Graz. From 2004 to 2011, he was a Research Fellow in Laser Zentrum Hannover in Germany (DAAD, DFG and the AvH). In 2013, he was granted the National Scholarship of the Slovak Republic.

aanstepa@gmail.com

Notes: