conferenceseries.com SciTechnol

J Regen Med 2017, 6:2(Suppl)
DOI: 10.4172/2325-9620-C1-003

International Conference on

3D Printing Technology and Innovations

July 05-06, 2017 Frankfurt, Germany

Metasurfaces with graphene lattice fabricated by direct laser writing

Artem Sinelnik
ITMO University, Russia

Metasurfaces are two-dimensional periodical structures that consist of nano- and micro-scale particles with the lattice spacing less than a wavelength of incident light. The fabrication of metasurfaces is novel area of materials science with many promising applications. Metasurfaces makes possible to tune the wavefront and phase of incident electromagnetic radiation according to arbitrary law. The aim of our work is to fabricate metasurfaces with graphene-type lattice (honey-comb structure) and to study it by means of optical methods. We fabricate over 300 samples with different parameters by exploiting two-photon polymerization direct laser writing technique. The side of the hexagonal comb is varied from 0.3 μm to 2 μm and the number of hexagons forming the structure is changed from a few to several hundreds. To control the quality of the synthesized samples, we use scanning electron microscopy. Also the fabricated structures are studied by optical methods. We investigate diffraction patterns of our structures in the visible range. An Nd-laser with 0.532 μm wavelength is used as light source. Although some samples have small sizes, the diffraction patterns on a 40 by 40 cm screen are bright and can be clearly analyzed by a naked eye. We investigate an evolution of the diffraction patterns of structure being transformed from metasurfaces to photonic crystal regime. This transition can be detected by appearance of the Laue diffraction.

artem.sinelnik.95@mail.ru