Ju-Hyung Kim, J Material Sci Eng 2016, 5:1(Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.034

OMICS International
conferenceseries.com

2nd International Conference on
Smart Materials & Structures
February 29-March 02, 2016 Philadelphia, Pennsylvania, USA

Solvent-free fluidic organic distributed feedback lasers via soft-lithography

Ju-Hyung Kim
Pukyong National University, Republic of Korea

Liquid organic semiconductors present strong advantages over conventional organic semiconductors in solid-state thin films, such as solvent-free device processing, ultimate mechanical flexibility and uniformity, and tunable optoelectronic responses. In a lasing context, these fluidic semiconducting materials can provide an excellent framework for flexible and tunable lasers if proper resonator structures and materials are used. Particularly since distributed feedback (DFB) structures show outstanding properties for lasing such as low threshold, high optical mode confinement, and high reflectivity, the compact integration of DFB grating structures into solvent-free optofluidic organic light-emitting devices is of strong interest for the development of tunable solvent-free liquid lasers with low lasing threshold. Here optically-pumped low-threshold blue, green and red liquid DFB lasers using solvent-free fluidic organic semiconductors and flexible polymeric substrates patterned with DFB gratings are presented. Experimental results also indicate that a tuning of the flexible liquid DFB laser emission peak can be achieved under mechanical bending, due to the high-aspect-ratio DFB grating pattern which causes largely diversified periods according to the mechanical deformation. Overall, the results strongly suggest great potential for a wide range of optoelectronic applications including data communications, highly sensitive bio- and chemical sensors, and portable analytic instruments.

Biography

Ju-Hyung Kim received the BS and MS degrees in Chemical and Biological Engineering from Seoul National University, Republic of Korea, in 2007, and the PhD degree in Advanced Materials Science from the University of Tokyo, Japan in 2012, and is working on organic semiconductors and organic/metal interfaces. Since 2014, he has been an Assistant Professor of Chemical Engineering at Pukyong National University, Republic of Korea. His research interest includes surface engineering and analysis on organic thin films, organic electronic and optoelectronic applications, and unconventional lithography methodology.

jaykim@pknu.ac.kr

Notes: