**The most important international scientific projects in year 2015**
Department EBL UISAV

**Title:** Study of e-beam resist parameters at 40 keV electron energy for application in the fabrication of nanostructures for sensor and photonic devices

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**Project type:** MAD – Joint research project BG-SK 2015-2017 on the base of International Scientific Cooperation between the Bulgarian Academy of Sciences and the Slovak Academy of Sciences

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**Partner's organisation:** Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria

**Annotation**

In the production of microelectronic circuits and devices, very precise profile control of structures in polymer resists is required. Process parameters gained experimentaly are required for the optimalization and application of the direct writing lithography method. Experimentaly gained process parameters are used consequently for the simulation of resulting structures in electron beam resist.

Lithographic characteristics of a negative electron beam resist HSQ XR-1541 and a positive electron beam resist AR-P 6200/2 at electron energy 20, 30 and 40 keV have been investigated.

Original results reprent exposure parameters of both resists at elecron energy 40 keV.

These results have been achieved in the Joint research project BG-SK 2015-2017 „Study of electron beam resists and patterning of nano-structures by electron beam lithography for gas sensor applications". Process parameters were used for pattern transfer of structures in the projects APVV 0395-12, APVV 14-0613 and VEGA-1/1106/12.

**Scientometric outputs**

1. HOTOVÝ, I. - KOSTIČ, Ivan - NEMEC, Pavol - PREDANOCY, M. - ŘEHÁČEK, V. Patterning of titanium oxide nanostructures by electron-beam lithography combined with plasma etching. In Journal of Micromechanics and Microengineering, 2015, vol. 25, iss. 7, art. no. 074006. (1.731 - IF2014). (2015 - Current Contents). ISSN 0960-1317. Type: ADCA

2. RÝGER, Ivan - VANKO, Gabriel - LALINSKÝ, Tibor - HAŠČÍK, Štefan - BENČUROVÁ, Anna - NEMEC, Pavol - ANDOK, Róbert - TOMÁŠKA, M. GaN/SiC based surface acoustic wave structures for hydrogen sensors with enhanced sensitivity. In Sensors and Actuators A: Physical, 2015, vol. 227, p. 55-62. (1.903 - IF2014). ISSN 0924-4247. Type: ADCA

3. ŠKRINIAROVÁ, J. - HRONEC, P. - ANDOK, Róbert - BENČUROVÁ, Anna - NEMEC, Pavol - WANG, D. - SCHAAF, P. Technological tuning of the HSQ XR 1541 resist in EBDW lithography. In Proceedings of ADEPT : 3rd International Conference on Advances in Electronic and Photonic Technologies. - Žilina : University of Žilina, 2015, p. 218-222. ISBN 978-80-5541033-3. Type: AEDA