

## Nanostructured surfaces

### Carbonization and formation of metal nanoparticles processes in ion-implanted PMMA

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In the present work, the results of slow positron beam spectroscopy (SPBS) study of carbonization in high-dose ( $2.5 \times 10^{16}$ ,  $3.75 \times 10^{16}$ , and  $5.0 \times 10^{16}$  ions/cm<sup>2</sup>) 40 keV boron-ion-implanted polymethylmethacrylate (B:PMMA) [1] and formation of metal nanoparticles in high-dose ( $2.5 \times 10^{16}$  and  $1.0 \times 10^{17}$  ions/cm<sup>2</sup>) 30 keV silver-ion-implanted polymethylmethacrylate (Ag:PMMA) [2] are reviewed. The features between carbonization and formation of metal nanoparticles processes in ion-implanted B:PMMA and Ag:PMMA as revealed from SPBS measurements of  $S(E)$  parameter, SRIM simulation and other proper techniques are considered.

1. Kavetskyy T., Tsmots V., Kinomura A., Kobayashi Y., Suzuki R., Mohamed H. F. M., Šauša O., Nuzhdin V., Valeev V., Stepanov A. L. Structural defects and positronium formation in 40 keV B<sup>+</sup>-implanted polymethylmethacrylate // J Phys Chem B.-2014.-**118**.-P. 4194-4200.

2. Kavetskyy T. S., Iida K., Nagashima Y., Kuczumow A., Šauša O., Nuzhdin V., Valeev V., Stepanov A. L. High-dose boron and silver ion implantation into PMMA probed by slow positrons: Comparison between effects of carbonization and formation of metal nanoparticles // Abstracts of 14<sup>th</sup> International Workshop on Slow Positron Beam Techniques and Applications (SLOPOS 14) (Matsue, Japan, 22-27 May, 2016), in press.