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Conjoint AES-EELS analysis of the sub-nanometric coatings

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The purpose of the work is to show possibilities of a joint electron spectroscopy of Auger Electrons (AES) and of energy losses on valence electrons (EELS) for analysis of the structural-chemical and phase state of 2D or sub-nanometric coatings. The composition, thickness, growth mechanism and electronic energy structure of coatings were determined according to the AES data. In addition, the structural-phase state and the local electronic spatial structure of the coating were determined according to the EELS data. The choice of the optimal probing depth (0.25 nm) has been ensured the mutual additivity of analysis by two methods and its adaptation to the sub-nanometric thickness of coatings. It is shown that EELS is very sensitive method for analysis of local valence electron density of atoms and that the variation of the energy of the primary beam and of parameters the coating (the thickness of the coating, the arrangement of adatoms-markers, the coating deposition regimes), as well as the subtraction of the contribution from the substrate, make possible to increase informativity of the AES-EELS analysis of sub-nanometric coatings and structural state of their interface.

Biography

Nikolay Plusnin is currently working as the Chief Researcher in the Institute of Automation and Control Processes of FEB of the RAS, Vladivostok, Russia. He has completed the studies as Doctor of Physical-Mathematical Sciences. His research interests are in nanomaterials for electronics and their structure-phase analysis. He was a Visiting Professor in Tohoku University, Sendai, Japan. He is also a Member of the Advisory Board of the International journal, *e-journal of Surface Science and Nanotechnology*. He has published more than 35 scientific articles. His research was supported by Russian Ministry of Education and Science, Academy of Sciences and Government.

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