FNM 2016 Program Committee cordially invites people to submit abstracts for The International Workshop on Functional and Nanostructured Materials to be held in Tbilisi, Georgia 6th -10th September 2016.

Optical Properties of Nanoparticles Clusters

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Thin films consisting of metal nanoparticles are widely used in various fields of science and technology. Examples are transparent conducting coatings, biosensors based on surface plasmon resonance, and substrates for observing surface- enhanced Raman scattering [1]. Currently, the range of application of island structures, whose optical and electrical properties may change in a wide range (depending on their morphology), constantly increases. Thin films of noble metals, which exhibit plasmon resonance in the visible spectral range and are fairly stable, are of particular interest. The optical properties of island films can be controlled by changing the sizes and shape of islands and their concentration on the surface of a transparent dielectric substrate [2-3]. However, one must apply different methods for metals of different groups of the periodic system to control the morphology and density of islands.

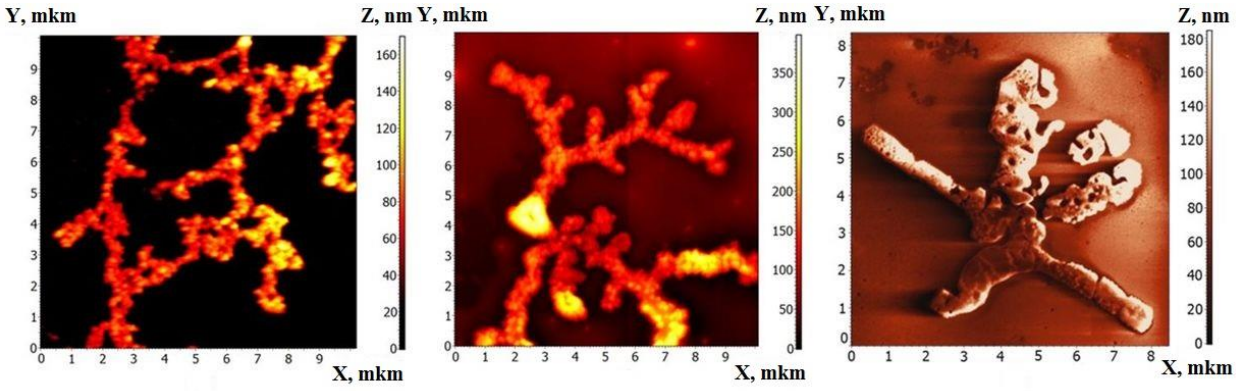

Figure 1. Images of silver (a), golden (b), and gold–silver (c) clusters fixed with atomic force microscopy

The formation of gold–silver cluster structures on colloidal solutions and on surfaces of glasses has been investigated. The properties of these structures are analyzed in dependence on the weight ratio of metal nanoparticles and the particle concentration in the colloid. It is shown that the optical properties of these structures may change significantly with a change in the morphological properties and chemical composition of the structures.

[1] A. Axelevitch et al., Phys. Proc. 32 (32), 1 (2012).

[2] A. A. Antipov et al., Opt. Spectrosc. 116, 2 (2014).

[3] A. A. Antipov et al., Opt. Spectrosc. 119, 1 (2015).

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