

# "Nanocomposites and nanomaterials"

## The size distribution of *InAsSbP/InAs(100)* quantum dots in the frame of modified for surface LSW theory

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Synthesis of semiconductor nanocrystals not only opens up new areas of application, but also new opportunities to control the properties of semiconductors.

As substrates for fabrication of two-dimensional matrices of holes by means of reactive ionic etching in the majority of studies gallium arsenide is used (GaAs), although silicon substrates are also used sometimes. On these substrates, by the method of molecular-beam epitaxy, artificial three-dimensional-ordered Quantum dots (QD) – crystals are currently grown.

The analysis of QD growth in *InAsSbP/InAs (100)* structure [1] at the stage of Ostwald ripening (OR) has been carried out in the frame of modified for surface Lifshitz-Slezov-Wagner (LSW) theory [2].

It has been found that after a 30 minute QD *InAsSbP* growth, their size distribution is well approximated by generalized Chakraverty-Wagner distribution. The growth of QD in the (OR) process is governed simultaneously by two mechanisms - surface diffusion and chemical reaction. With less time for QD growth OR stage occurs partially (20 min) or does not occur at all (10 min).

1. Arutyunyan V. M., Hambaryan K., Arutyunyan V. G., Sukyassyan P., Boek T., Shmydtbauer J., Bansen R. The Ostwald ripening at nanoengineering of *InAsSbP* spherical and ellipsoidal quantum dots on *InAs (100)* surface // Proceedings of the National Academy of Sciences Armenyy, Physics. –2013 –**48**(1). P. 55-62.

2. Vengrenovich R.D., Ivanskyyi B.V., Moskalyuk A.V. Generalized Chakraverty-Wagner Distribution // Ukrainian Journal of Physics. –2008.–**11**. P. 1101-1109.