Concentric GaAs nanorings growth modelling

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The nanostructures formation process using the droplet epitaxy technique was investigated by Monte Carlo simulation. The simulation was fulfilled for two-dimensional and three-dimensional geometry substrates. The nanostructures morphology dependence on the growth temperature was presented. Crystal cluster, single and double rings were observed. The nanostructures shape was shown to be determined by the gallium diffusion length. The conditions of double rings formation during the droplet epitaxy were considered using analytical and numerical approaches. The factors that determine the rings location and shape were analyzed. The growth morphology was demonstrated to be dependent on the initial distance L between the droplets. The double ring formation was possible at a low droplet density only, when the As-stabilized region could be created between the droplets.

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