

Initial optimization of the growth conditions of GaAs homo-epitaxial layers after cleaning and restarting the MBE reactor.

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The Molecular Beam Epitaxy (MBE) technique is renowned as the most suitable for growth of high quality crystalline materials and nanostructures such as GaAs. Although, once established, optimal growth parameters required for repeatability of top quality structures may be easily lost as MBE is highly sensitive to any changes in the system. Especially, routine servicing procedures, which include any activity which requires unsealing of the growth chamber are devastating for developed growth parameters and force the necessity of recalibration. In this work, we present the process of growth parameters pre-optimization for obtaining homoepitaxial GaAs layers after servicing and restarting MBE system. Namely we present, how each step of reestablishing optimal growth condition influence various characteristics of obtained GaAs layers. Those include in situ, structural, and spectral measurement techniques.

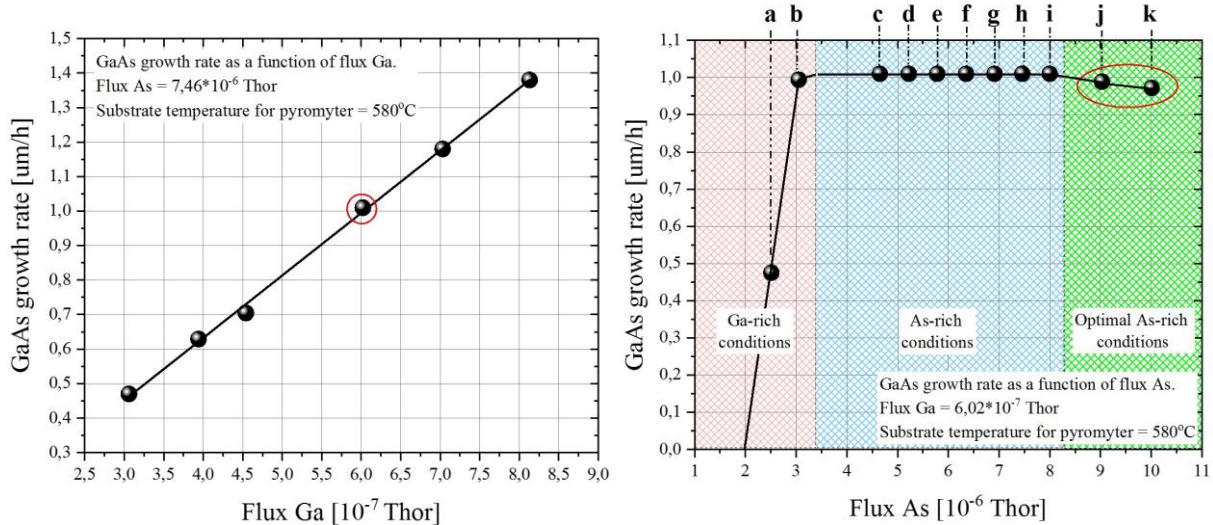


Diagram 1. The dependence of the growth rate of GaAs layers on the gallium flux for the constant arsenic flux 7.46×10^{-6} Thor and the substrate temperature of 580°C .

Diagram 2. The dependence of the growth rate of GaAs layers on the arsenic flux for the constant gallium flux 6.02×10^{-7} Thor and the substrate temperature of 580°C . 3 areas are marked in the diagram:

- Red - gallium rich condition,
- Blue - arsenic rich condition,
- Green - arsenic rich optimal condition.

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