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Title

Process for obtaining of semiconductor nanowires in one step via anodization

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Patent no.

Patent application No. 6673/2020

Semiconductor nanowires, especially from III-V semiconductor compounds, demonstrate an obvious potential for applications as active components in solar cells, photodetectors, light emitters, transistors and other applications. The production of nanowire in masses with perpendicular orientation to the support surface it's a challenge and is very important for applications.

**Description
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Herein, we propose the technological route via electrochemical etching of bulk GaAs, GaP, and InP substrates for obtaining of a network of semiconductor nanowires with a diameter in the range of 50 - 500 nm, the nanowires being oriented perpendicular to the surface of the substrate and with a homogeneous distribution on the surface of the semiconductor wafer.

The advantages of the proposed process over other already existing processes are: - the possibility of GaAs, GaP, and

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InP nanowire networks obtaining with a diameter in the range of 50 - 500 nm oriented perpendicular to the crystal surface in a single technological step; - crystallographic orientation of nanowires can be tuned by using semiconductor wafers with different orientations; - this newly developed approach opens the possibility to avoid the contamination of obtained nanowires due to direct electrochemical dissolution of the crystalline material around the emerging nanostructures. As a result of anodization at optimal electrochemical parameters, the nanowires are not growth but the space around the nanowires is etched and the remaining nanowires have the same crystallinity and purity as used wafer.

This work received partial funding form the state program Grant #20.80009.5007.20.