Nanoscale physics

Properties of Doped GaSb Whiskers at Low Temperature

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Temperature dependencies of n-type GaSb whisker resistance was measured in temperature range 1,5–300 K and magnetic field up to 1 T. The peculiarities of whisker resistance in the low temperature range (sharp drop of the whisker resistance at about 4,2 K) were observed.

Fig.1. Magnetic field dependence of magnetoresistance for GaSb whiskers at various fixed temperatures

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The changes of the magnetoresistance in magnetic field for GaSb whiskers at various fixed temperatures is presented at Fig.1.

To check the cause of electron localization one can suppose an existence of superconductance state in the whiskers taking into account the data of [1-2].

The possible reason of superconductivity in the whiskers could be appearance of weak antilocalization which leads to emergence the negative magnetoresistance. It was found that the magnetoresistance of these whiskers in low field regime can be described by two-dimensional weak antilocalization (2D WAL) model.

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