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The effect of sulphur-based treatment on the quality of GaSb surfaces

The effect of sulphur treatment on the electrical and optical properties of Te doped bulk n-GaSb has been studied by current-voltage (IV), capacitance-voltage (CV), photoluminescence (PL) and X-Ray photo-spectroscopy (XPS). Treating the GaSb surface with Na2S:9H2O, (NH4)2S and (NH4)2SO4 resulted in an improvement in the reverse leakage current of up to an order of magnitude for Au/n-GaSb Schottky barrier diodes (SBDs) while an increase in the photoluminescence intensity was also observed. XPS of the sulphur treated surfaces suggest that S2- ions interact with the degenerate GaSb surface resulting in its partial stabilization.

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