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Surface morphology, electrical and optical properties n-type doped MOCVD grown GaSb using dimethyltellurium

Dimethyltelluride has been used as a dopant source for GaSb epilayers grown via atmospheric pressure metalorganic chemical vapour deposition (MOCVD). It has been observed that the electron concentration (n) is proportional to the Te partial pressure in the vapour phase, until n saturates at high Te partial pressure. Electron concentrations as high as $1.36 \times 10^{18} \text{cm}^{-3}$ have been measured with imperfect morphology, and as high as $1.22 \times 10^{18} \text{cm}^{-3}$ with excellent, mirror like, morphology. These appear to be the highest electron concentrations reported to date for any MOCVD-growth epitaxial n-type GaSb doped with DMTe and grown at 540 °C with a V/III ratio of 1.4. The absorption spectra of GaSb doped with DMTe show that the heavily doped samples have a less abrupt edge. The absorption coefficient (α) strongly depends on the free carrier concentration. PL spectra of the epilayers are also reported.

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..... I absorption spectra of four GaSb samples with different concentration of DMTe at 300 K. Fig. 6. PL spectra of GaSb doped with different concentrations of DMTe. Correspondence address Dr. Ari Handono Ramelan Physics Department, Faculty of Mathematics and Natural Sciences Sebelas Maret University (UNS) Jl. Ir. Sutami No. 36A Surakarta 57126 Indonesia Tel.: +62 271 663 375 Fax: +62 271 663 375 E-mail

From Ari Handono Ramelan ¹ | Pepen Arifin ² | Ewa Goldys ³

¹Faculty of Mathematics and Natural Sciences Sebelas Maret University (UNS), Physics Department, Surakarta, Indonesia

²Faculty of Mathematics and Natural Sciences Bandung Institute of Technology (ITB), Physics Department, Bandung, Indonesia

³Faculty of Science and Engineering, Macquarie University, Physics Department, Sydney, Australia

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