

# OPTICAL ANISOTROPY IN CUPT-ORDERED DILUTE GAASBI ALLOYS

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We investigate optical anisotropy in dilute GaAs<sub>1-x</sub>Bi<sub>x</sub> alloys ( $x \sim 0.027-0.056$ ) induced by spontaneous CuPt<sub>B</sub>-type atomic ordering. X-ray diffraction and transmission electron microscopy reveal CuPt<sub>B</sub> ordering in B+ and B- subvariants on exact (001) GaAs substrates [1,2]. Despite a low ordering parameter ( $\eta \sim 0.1$ ), we observe pronounced optical anisotropy effects. Polarization-dependent photoluminescence shows polarisation ratios up to 2.4 at room temperature. Transmittance spectra, birefringence, and linear dichroism measurements confirm this anisotropy [3,4]. Modulation spectroscopy determines the ordering-induced valence band splitting to be 43-80 meV, comparable to conventional ordered III-V alloys despite the lower ordering parameter [5,6]. This suggests a strong influence of Bi atoms on the electronic structure.

Our findings provide insights into the interplay between atomic structure and optoelectronic properties in GaAsBi alloys, offering new possibilities for analysing and exploiting these characteristics in future bismide-based devices for near- and mid-infrared optoelectronics applications [7].

## References

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