

APPLICATION NOTE

EXCELLENT PURITY IN MBE GROWTH

MBE49 Production System

To satisfy the demanding specifications relative to MBE, ultra-clean conditions during process and ultra pure materials are required.

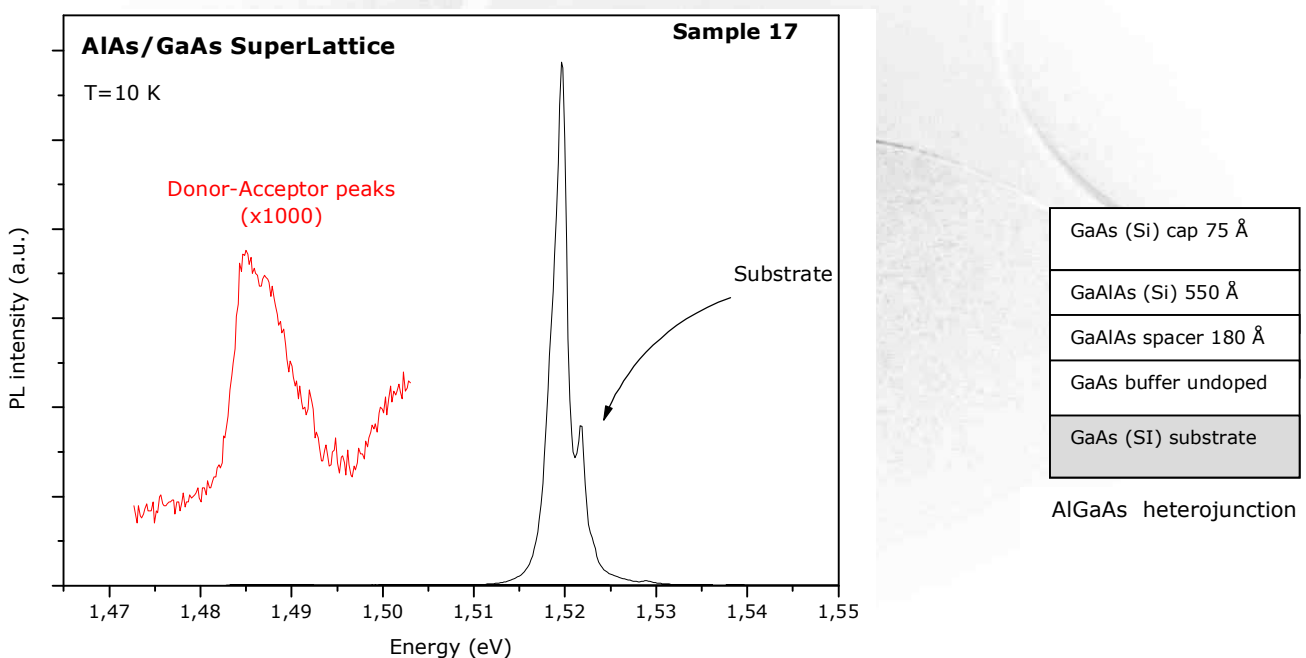
To demonstrate both of these requirements, bulk GaAs, AlGaAs/GaAs heterojunction and AlAs/GaAs superlattice structures were grown using the Riber MBE49 (multi-4") production system, equipped with the double filament effusion cell, Model ABN700DF for Ga and Al, and with the arsenic valved cracker cell, Model VAC2000.

Results:

Hall effect measurements on 13 μm thick bulk GaAs exhibit:

- At T=77K a very low background concentration of $1.0 \times 10^{14} / \text{cm}^3$ and a mobility as high as 123, 000 $\text{cm}^2/\text{V.s}$.
- Hall effect measurements of the AlGaAs heterojunction structure exhibit:
- A high mobility of 169, 000 $\text{cm}^2/\text{V.s}$ at 77K with a sheet concentration of $5.5 \times 10^{11} / \text{cm}^2$.
- Photoluminescence measurements of the GaAs/AlAs superlattice exhibit:
- A low intensity of donor/acceptor peaks, sign of very few C and/or O related deep levels in the grown material, showing the high purity of the materials and the excellent cleanliness of the MBE system.

Growth and characterization of the wafers were performed by the Riber Application Laboratory.



For more information please contact info@riber.com