

V. NANOSTRUCTURES IN THE DEFECT

A small Bi rich inclusion (defect) observed on the surface of the wafer was analyzed by high resolution SEM as shown in figure 5. (a, b). It showed a dent of width 25 μm at the corner of the inclusion. Scanning of the dent by increasing the resolution of SEM up to 2 μm scale (figure 5. c) showed small structures with the size smaller than 1 μm present in the dent. Observation of these structures with the resolution of 500 nm scale (Figure 5. d) indicates presence of nanosize InSbBi structures. The nano structures observed are similar to nano tubes.

VI. CONCLUSION

Microscopic analysis of the surface of InSbBi crystal grown by VDS technique indicate good crystal quality semiconductor material with minimum level of defect density. Scanning of the surface by SEM confirm the crystal quality exhibiting large surface area with uniform texture and less defects. Elemental mapping of surface of the substrate also show almost uniform distribution of the In, Sb and Bi composition. SEM scanning of a dent (crystal defect) with the resolution of 500 nm scale indicates presence of nano-structures of size ~ 150 nm.

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