

Nano scale fabrication and characterization of graphite planar-type structures

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We report the details of nano scale fabrication methods and transport characteristics studies for the planar-type structures fabricated in micron scale graphite flakes. We have fabricated several in-plane areas of planar-type structures in thin graphite layers (thickness ~ 500 nm) to characterize transport properties. The areas of $10 \times 10 \mu\text{m}^2$, $6 \times 5 \mu\text{m}^2$, $6 \times 2 \mu\text{m}^2$ and $1 \times 1 \mu\text{m}^2$ planar-type structures have been fabricated using focused ion beam (FIB). This exhibits semiconducting behavior but obtained resistance at 300K and 30K varies according to the size of the planar-type structures. Current(I)- Voltage(V) characteristics were done for these planar-type structures. These results show ohmic behaviour at 300K and diode-like characteristics observed when temperature downs to 30K. We have compared the results of all these planar-type structures and observed asymmetric behavior. The size of the planar-type structure affects the shape of the I - V curve. However it is observed symmetric behavior in I - V characteristics for c -axis fabricated sample. The detailed c -axis behavior and conductance(dI/dV) studies will be discussed in this talk. Keywords: FIB, planar-type structure, Van der waals forces.