

Energy Gap from Point Contact Spectroscopy on MgB₂

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We performed the point contact spectroscopy on the newly discovered superconductor MgB₂ thin film with Au tip. In the point contact spectroscopy in the metallic Sharvin limit, the differential conductance below gap is twice of that above gap by virtue of Andreev Reflection. After some cleaning processes of sample preparation such as ion-milling and wet etching, the obtained dI/dV vs voltage curves are fitted well to the Blonder-Tinkham-Klapwijk(BTK) formalism. Gaps determined by this technique were rather distributed in the range of 4 meV~8 meV compared with the BCS value of 5.9 meV in the weak coupling limit. For this difference, we discuss the symmetry of the gap parameter and the degradation of the surface of the sample. Also we present the temperature dependence of the conductance vs voltage curve.

Keywords : point contact spectroscopy, magnesium diboride