

Tunneling Spectroscopy in Organic Cu-Pc/d-wave Superconductor

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The transport properties of an organic copper (II) phthalocyanine (Cu-Pc)/d-wave superconductor (Or/S) junction have been studied for the application of polaronic quasiparticle injection three-terminal devices. We report the current transport properties of a normal metal/organic conductor/ superconductor tunnel junction as a novel high- T_c superconducting three terminal device. The organic Cu-Pc layer was used for a quasiparticle (QP) injector. The injection of polaronic QP from Cu-Pc interlayer into superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ (BSCCO) or $\text{YBa}_2\text{Ca}_3\text{O}_y$ (YBCO) thin film generated a substantially larger nonequilibrium effect as compared to the normal QP injection current. In case of BSCCO tunnel junction, the observed current gain was over 2.5. The tunneling spectroscopy of a Au/Cu-Pc/BSCCO exhibited a zero bias conductance peak (ZBCP) which may be Andreev reflection at a Cu-Pc due to d-wave superconductor junction. This work was support by KOSEF Joint Research Project under The Korea-Japan Basic Scientific Promotion Program (2000-6-114-01-2)

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