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Optical spectroscopy of superconducting Pt-doped $BaFe_2As_2$[1]
ZHEN XING, M. M. QAZILBASH, Department of Physics, College of William and Mary, SHANTA SAHA, J. PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park — Substitution of iron with platinum in $BaFe_2As_2$ leads to suppression of the antiferromagnetic and structural transitions, and the occurrence of bulk superconductivity with superconducting transition temperature (T_c) around 20 K. In this work, we perform optical spectroscopy study of a $BaFe_{1.9}Pt_{0.1}As_2$ single crystal. The *ab*-plane optical conductivity has been obtained by performing cryogenic infrared reflectance spectroscopy and spectroscopic ellipsometry both above and below T_c. Below T_c, bulk superconductivity is directly observed as perfect reflectance in the far infrared data. We model the optical conductivity in the superconducting state using Mattis-Bardeen formalism and find that the data is best fit with two energy gaps. We also analyze the optical conductivity in the normal state and discuss the nature of charge transport.

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