

Abstract Submitted
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The existence of substantial Ca 3d derived states at E_F in Ca-intercalated graphite superconductor CaC_6 ¹ HIROYUKI OKAZAKI, RIKIYA YOSHIDA, KEISUKE IWAI, KENGO NOAMI, Okayama University, TAKAYUKI MURO, TETSUYA NAKAMURA, JASRI/SPring-8, TAKANORI WAKITA, YUJI MURAOKA, MASAOKI HIRAI, Okayama University, FUMIAKI TOMIOKA, YOSHIHIKO TAKANO, NIMS, ASAMI TAKENAKA, MASAHIRO TOYODA, Oita University, TAMIO OGUCHI, Hiroshima University, TAKAYOSHI YOKOYA, Okayama University — We have performed soft x-ray photoemission studies of Ca-intercalated graphite superconductor CaC_6 ($T_c = 11.2$ K). The valence band spectrum shows six main structures that correspond to those of calculated DOS that predicts large Ca 3d contribution at the Fermi level (E_F). The Ca 2p core level spectrum has a very large asymmetric line shape, suggesting the existence of Ca 3d derived conduction electrons at Ca sites. These results provide spectroscopic evidence for the existence of Ca 3d electrons at E_F , which probably play a crucial role for the unusually superconductivity. The electronic structure of CaC_6 is compared with the electronic structures of other graphite intercalation compounds, providing deeper understanding of the superconductivity of CaC_6 .

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