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Transfer of a Single Carbon Fullerene at Small Nano-Gap YOSHI-FUMI OSHIMA, YOSHIHIKO KURUI, KUNIO TAKAYANAGI, Tokyo Institute of Technology, PRESTO-JST COLLABORATION, CREST-JST COLLABORATION — A single carbon fullerene shows jump-to-contact behavior in conductance evolution when bringing an electrode close to it. Theoretically, the jump-to-contact behavior has been explained by deformation of the fullerene, but, it has not been proved experimentally. In this study, we investigated the geometry of the fullerene at the moment of jump-to-contact using transmission electron microscope – scanning tunneling microscope system. A single carbon fullerene was synthesized in-situ [1]. We sometimes observed that the single carbon fullerene was transferred back and forth between both electrodes at the bias voltage of 0.6 V when the gap distance became almost 1nm which was still tunneling regime in conductance. Such a transfer was never observed when the bias voltage was lower than 0.1 V. Since the conductance showed the order of 10^{-1} G0 in pulse at the moment of transfer, the fullerene was suggested to be expanded along the gap to have a contact with the opposite electrode. [1] M. Yoshida et al., Jpn. J. Appl. Phys. 46, L67 (2007).

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