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Electrical evidence for the encapsulation of C_{60} inside a carbon nanotube: Random telegraph signal and hysteric current-voltage characteristics[1] YUNG WOO PARK, Dept of Physics and Astronomy & NSI-NCRC, SNU, Korea, HAN YOUNG YU, ETRI, Korea, DONG SU LEE, URSULA DETTLAFF-WEGLIKOWSKA, SIEGMAR ROTH, MPI-FKF, Germany — We present electrical evidence for the encapsulation of C_{60}'s inside a carbon nanotube: random telegraph signals (RTSs), and hysteric current-voltage characteristics. The RTSs is ascribed to the instability of the quantum harmonic oscillations of C_{60}'s. RTSs are smeared out at a temperature which is consistent with the energy level of the vibrational quantum mediated by the van der Waals binding between the carbon nanotube and C_{60}'s. In addition, hysteric behavior in cyclic current-voltage characteristics is explained by the longitudinal motion and resettlement of the C_{60}'s with the modulation of the size of the quantum dot mediated by the C_{60} insertion.

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