

Abstract Submitted
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Can we look into carbon nanotubes by infrared light?¹ KATALIN KAMARAS, ARON PEKKER, ZSOLT SZEKRENYES, Research Institute for Solid State Physics and Optics, Hungarian Academy of Sciences, Budapest, FERENC SIMON, Budapest University of Technology and Economics, BEA BOTKA, RUDI HACKL, Walther-Meissner-Institute, Garching, AKOS BOTOS, ANDREI KHLOBYSTOV, University of Nottingham — Individual molecules filled into carbon nanotubes exhibit Raman activity but very weak, if any, infrared absorption. We will present infrared (transmission and ATR), Raman and transmission electron microscopy data of various filled nanotubes (sorted by diameter and metallicity; encapsulating organometallic, aromatic and fullerene-based molecules) to illustrate this puzzling behavior. In the infrared spectra of double-walled carbon nanotubes, however, vibrational signatures of the inner and outer tubes are clearly discernible. A strong proof for this assignment is the shift of the inner-tube modes with ^{13}C isotope content in samples where the inner tube is enriched with ^{13}C .

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