Vibrational spectroscopic study of SiO2-based nanotubes

Abstract:
Novel organic-inorganic hybrid nanotubes containing silica and ethane (EtSNT), ethylene (ESNT) and acetylene (ASNT) units, as well as brominated ESNT (Br-ESNT) and glycine-modified Br-ESNT (Gly-ESNT) have been studied by IR and Raman spectroscopy. The results are compared with the spectral features for conventional silica nanotubes (SNT) and amorphous silica. Bands peculiar to organic moieties have been detected and assigned. Assignment of the silicate backbone vibrations was based on the results of normal coordinate calculations. Furthermore, characteristic silicate, so-called 'nanotube' vibrations have been identified and their band positions have been summarized to serve as a future reference for such compounds. SiOSi antisymmetric stretchings were observed in the range 1000-1110 cm\(^{-1}\), while the symmetric stretchings appeared between 760 and 960 cm\(^{-1}\) for EtSNT, ESNT and Br-ESNT. Force constants have been refined for models of the repeating structure units: O\(_3\)SiOSi(OSi)(3) for SNT and SiCH\(_n\)CH\(_n\)Si(OSi)(3) for organosilica nanotubes (Kongresstitel: ISI Document Delivery No.: 146NF Times Cited: 0 Cited Reference Count: 43 Fischer, Christian E. Mink, Janos Hajba, Laszlo Bacsik, Zoltan Nemeth, Csaba Mihaly, Judith Raith, Alexander Cokoja, Mirza Kuehn, Fritz E. Cokoja, Mirza/B-6906-2009; Kuhn, Fritz/A-3113-2010 Universität Bayern)
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