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标题: Multi-walled carbon nanotubes/PMMA composites for THz applications
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摘要: Dielectric properties of polymethyl methacrylate (PMMA) filled with small amounts (0.25-2 wt.%) of CVD made multi-walled carbon nanotubes (CNT) versus nanotubes diameter and oxidation degree have been investigated by terahertz time-domain spectroscopy. A high electromagnetic (EM) attenuation strongly increasing with frequency has been found for all types of CNT fillers. It has been demonstrated that the CNT oxidation treatment has a significant impact on electromagnetic response properties of CNT/PMMA composites in the THz frequency range for CNT content up to 1 wt.%, while the mean CNT diameter has not been found as an important factor influencing the EM behavior of composite films for particular nanotube geometry (CNT length is 10 mu m; average outer diameter is 9 or 12-14 nm). At the same time, the THz transmission spectra of PMMA with 2 wt.% are proved to be very similar for all types of CNTs embedded. The resonance dielectric dispersion has been observed for all studied samples, which can be attributed to the phonon resonance in PMMA matrix. Crown Copyright (C) 2012 Published by Elsevier B.V. All rights reserved.
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