

## MWNTs和MWNTs/云母复合物的太赫兹光谱研究

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摘要：

文章采用THz-TDS技术分别研究了室温大气环境下多壁碳纳米管(MWNTs)和MWNTs/云母复合物在0.2~1.75THz波段的吸收谱、折射率谱、复介电常数和屏蔽效能。结果表明两种样品在此波段有明显的特征吸收峰且吸收谱存在显著差异,两种样品的平均折射率分别为4.27(MWNTs)和1.81(MWNTs/云母复合物)。随着频率的增加,MWNTs的折率先增大后减小,而MWNTs/云母复合物的折射率减小,呈现反常色散现象。MWNTs在0.25~1.5THz的范围内屏蔽效能达到30dB以上,而MWNTs/云母复合物在0.2~1.75THz的范围内屏蔽效能小于30dB。

关键词：太赫兹时域光谱技术；MWNTs/云母复合物；吸收系数；复介电常数；屏蔽效能

## Terahertz Spectroscopic Investigation of MWNTs and MWNTs/mica

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**Abstract:**

Terahertz time-domain spectroscopy (THz-TDS) was used to measure the absorbance, refractive index, dielectric constants and shielding effect of MWNTs and MWNTs/mica in the frequency range of 0.2~1.75THz at room temperature. The results indicate that two samples have distinct absorption features, which have significance level in such frequency range. The average refractive indices of two samples are 4.27 (for MWNTs) and 1.81 (for MWNTs/mica) respectively. With frequency increasing, the refractive index of MWNTs firstly increases and then decreases, and that of MWNTs/mica declines, the latter exhibits anomalous dispersion. The shielding effect of MWNTs achieves more than 30dB in the frequency range of 0.25~1.5THz, and MWNTs/mica achieves less than 30dB in the frequency range of 0.2~1.75THz.

**Keywords:** terahertz time-domain spectroscopy; MWNTs/mica; absorbance; complex dielectric constant; shielding effect

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