

Ag/CNT nanocomposites and their single-and double-layer electromagnetic wave absorption properties

ABSTRACT

The electromagnetic wave absorption properties of single- and double-layer silver nanoparticle/carbon nanotube (Ag/CNT) nanocomposites were evaluated. The reflection loss (R.L.) of the samples was calculated based on the measured complex permittivity and permeability. The double-layer composites constructed from CNT 30 wt.% and Ag/CNT 30 wt.% with total thickness of 3.3 mm showed a minimum R.L. of ~ -52.9 dB (over 99.999% absorption) at 6.3 GHz. The bandwidth of reflection loss less than -10 dB was observed at 3 regions, with wideness of 3.5, 0.8, and 1.5 GHz. Thin absorber with large R.L. and wide response bandwidth at low and high frequency regions can be obtained with double-layer composites. The capability to modulate the absorption and bandwidth of these samples to suit various applications in different frequency bands indicates that these nanocomposites could be an excellent electromagnetic wave absorber.