

Filler size effect in graphite/paraffine wax composite on electromagnetic interference shielding performance

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Graphite exhibits electromagnetic wave attenuation and high electrical conductivity. In this study, we analyzed the electromagnetic interference shielding effectiveness (EMI SE) performance and electric conductivity of composites fabricated by varying the size of graphite fillers and explained resulting attributes through the relative permittivity and geometrical characteristics of the filler. When the graphite/paraffine wax composite was fabricated using large-sized graphite (KS150), the spacing between the graphite fillers became widened, enabling electromagnetic waves to leak through the gap. The analysis results indicated that KS150 graphite exhibited an EMI SE performance of under 10 dB when the filler content was 30 wt%. However, when the content was increased to 50 wt%, the EMI SE performance improved sharply to 40 dB. In contrast, when the composite was filled with small-sized graphite (KS6), having a high ratio of surface to volume, the EMI SE performance was greater than that with the largesized graphite at low loading.