

Absorption Dominant Electromagnetic Interference Shielding Performance of rGO/MoS₂
Hybrid Nanofiller Reinforced Polyurethane Composite Foam

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High-performance electromagnetic shielding with strong absorption and lightweight are necessary for industry and military applications. To obtain the desired performance, two-dimensional (2D) layered structure nanosheets, such as graphene and graphene-like, were adopted due to their unique structure and properties. Here, a hybrid nanofiller of reduced graphene oxide-molybdenum disulfide (rGO/MoS₂) composite was prepared by a one-pot hydrothermal reaction. Further, nanocomposite foam of thermoplastic polyurethane was prepared by a unique phase separation technique. The hybrid nanostructure of rGO/MoS₂ prevents two-dimensional nanosheets re-stacked and can be applied in the electromagnetic wave absorption field. From the preliminary shielding tests conducted in the X band (8.2–12.4 GHz) frequency range, indicate the hybrid nanofiller and porous structure of foam helped in improving the conduction and polarization losses synergistically. We may reasonably conclude that rGO/MoS₂ composite can serve as excellent light-weight electromagnetic wave absorbers and can be widely used in practice.