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MWCNT/CuFe10Al2O19/Polyanilie Nanocomposite for Microwave Absorbing Applications

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Abstract : Development of microwave absorbing material is a growing field of research in both the commercial and defense sector, and also to enrich the field of stealth technology. The recent work is attentive to the preparation of nanocomposite based on acid modified MWCNT, hexagonal shaped magnetic M-type hexaferrite (CuFe10Al2O19) and polyaniline. CuFe10Al2O19 was prepared by a facile chemical co-precipitation method. An in-situ approach was employed for the coating of polyaniline on MWCNT/CuFe10Al2O19 nanocomposite. The final fabrication of this nanocomposite for microwave measurements was done suitably in the matrix of thermoplastic polyurethane with 10% filler content. The nanocomposites showed the maximum reflection loss of -60.2 dB (in X-band) at the thickness of 2.5 mm with a broad absorption range in contrast to the pristine MWCNT and CuFe10Al2O19. Addition of PANI improves the microwave absorption property of the nanocomposites. The thermal stability of the prepared nanocomposites is also very high.

Keywords : magnetic materials, microwave absorption, MWCNT, nanocomposites
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