

Electromagnetic Interference Shielding and Microwave Absorption Properties of Polyaniline/Iron Nanowires

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Abstract

Electromagnetic wave shielding material have attracted much attention for applying in life and electronic equipment. The purpose of this study is combining iron nanomaterials with conductive polymer to enhance the shielding effect of electromagnetic wave. The iron nanomaterial and polyaniline (PANI) have environmental stability and low cost, and it also shows the application prospect of electromagnetic interference (EMI) in other researches.

In this study, different weight ratios and shapes of synthesized iron nanomaterials are combined with PANI by oxidation reduction method and microemulsion polymerization to form of PANI. The iron and PANI proportions were 10/90, 20/80, 30/70, 40/60. In addition, the shapes of the nano iron are nanowires and nanoparticles,

From SEM images, the nanowires have a particle size of 124-392 nm, while nano particles are 126-259nm. EMI result show that PANI/Fe nanowires 10/90 has the best shielding effect, when setting the rotation angle of four test pieces to 90 degrees, it is shaded maximum EMI shielding at 7.6 GHz (-7.2 dB).

Keywords – *Electromagnetic interference, Iron nanowires, Iron nanoparticles, Polyaniline*