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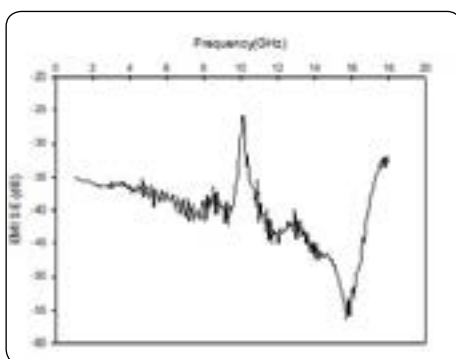
Materials Science and Engineering

June 11-13, 2018 | Barcelona, Spain

Lightweight filler for EMI shielding: carbon materials decorated with silver nanoparticle

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This work is about electromagnetic interference shielding, its frequency range is 1-18 GHz. The wavelength is called centimeter wave, and we do not count the wave pass. So I tried to measure the shielding ability by putting a filler in the foam to try to cover a wider range of shielding while reducing the filler. The filler is some carbon materials that are decorated with increasing electrical conductivity. When the carbon materials are modified with acid and ultra sonicating powerfully, however, the carbon properties are decreasing generally, so I used amphiphiles to decorate metals. The electromagnetic waves are reflected and absorbed out of the pores. Transmission Electron Microscope (TEM) and Micro-CT show fillers network. The filler is well contact each others and enclose foam's pore in foam matrix. For Ag decorated on carbon materials, use SEM and Raman Spectrometer. Electromagnetic Interference shielding performance is tested with Vector Network Analysis as the 2mm thickness in 1-18GHz.



Recent Publications:

1. Sanjay R. Dhakate, Kiran M. Subhedar, Bhanu Pratap Singh (2015) Polymer nanocomposite foam filled with carbon nanomaterials as an efficient electromagnetic interference shielding material. RSC Adv., 2015,5, 43036
2. Jean-Michel Thomassin, Christophe Pagnouille, Lukasz Bednarz, Isabelle Huynen, Rodert Jerome and Christophe Detrembleur(2008) Foams of polycaprolactone?MWNT nanocomposites for efficient EMI reduction, J. Mater. Chem., 18, 792–796
3. Ji Mun Kim, Yeongbeom Lee, Myung Geun Jang, Chonghun Han, Woo Nyon Kim(2017) Electrical conductivity and EMI shielding effectiveness of polyurethane foam-conductive filler composites. J. APPL. POLYM. SCI. DOI: 10.1002/APP.44373
4. Ding-Xiang Yan, pEng-Gang Ren, Huan Pang, Qiang Fu, Ming-Bo Yang , Zhong-Ming Li(2012) Efficient electromagnetic interference shielding of lightweight graphene/polystyrene composite, J. Mater. Chem., 22, 18772
5. Rajeev Kumar, Sanjay R. Dhakate*, Tejendra Gupta, Parveen Saini, Bhanu P. Singh and Rakesh B. Mathur (2013) Effective improvement of the properties of light weight carbon foam by decoration with multi-wall carbon nanotubes, J. Mater. Chem. A, 1, 5727-5735.

Biography

Chae Lin Kim lin do work for EMI shielding and heat flow. She is the master's course since july 2017.

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