

Graphene Incorporated Polyurethane Foams for Sound Damping Materials with Electromagnetic Interference Shielding Performance

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Abstract

Graphene incorporated polyurethane (PU) nanocomposite foams for sound damping materials with electromagnetic interference (EMI) shielding performance were developed using CO₂ supercritical fluid (SCF) technique for uniform dispersion of graphene nano-sheets. The CO₂ SCF allowed well distributed dispersion of graphene by decreasing the viscosity of polymeric methylene diphenyl diisocyanate. PU/Graphene nanocomposite foams exhibited a higher compressive strength, modulus, and sound absorption coefficient than pristine PU foam with low content of graphene. Simultaneously, Graphene nanocomposite foams had EMI shielding performance due to 3D conductive graphene network.

References

- [1] Yang, J.; Wu, M.; Wu F.; Fei Z.; Zhong, M., *J. of Supercritical Fluids*, 1 (2011) 201
- [2] Li, Y.; Pei, X. L.; Shen, B.; Zhai, W. T.; Zhang, L. H.; Zheng, W. G., *RSC Adv*, 5 (31) (2015) 24342
- [3] Ling, J. Q.; Zhai, W. T.; Feng, W. W.; Shen, B.; Zhang, J. F.; Zheng, W. G.,

ACS Appl. Mater. Interfaces, 5 (7) (2013) 2677

- [4] Yan, D. X.; Pang, H.; Li, B.; Vajtai, R.; Xu, L.; Ren, P. G.; Wang, J. H.; Li, Z. M., *Adv. Funct. Mater.*, 25 (4), (2015) 559

Figures

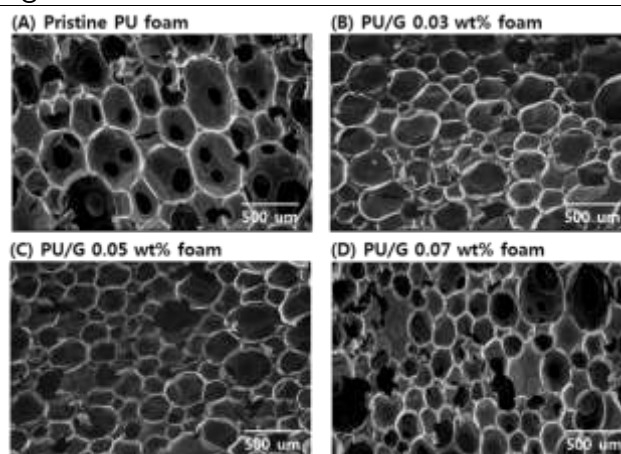
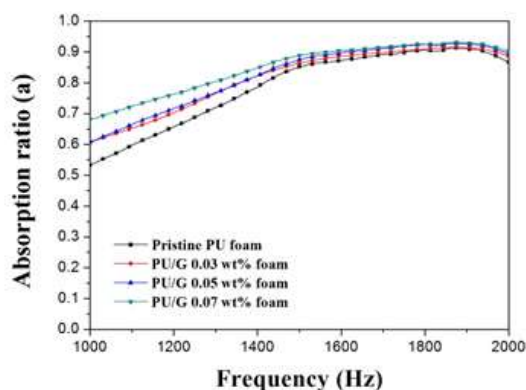


Figure 1: Cell wall of pristine PU foam(A) and PU/G 0.03-0.07wt% nanocomposite foam(B,C,D)



Sound absorption ratio of Graphene/PU nanocomposite foams