

**Microstructure driven magnetic composite for excellent microwave
absorption in extended Ku-band**

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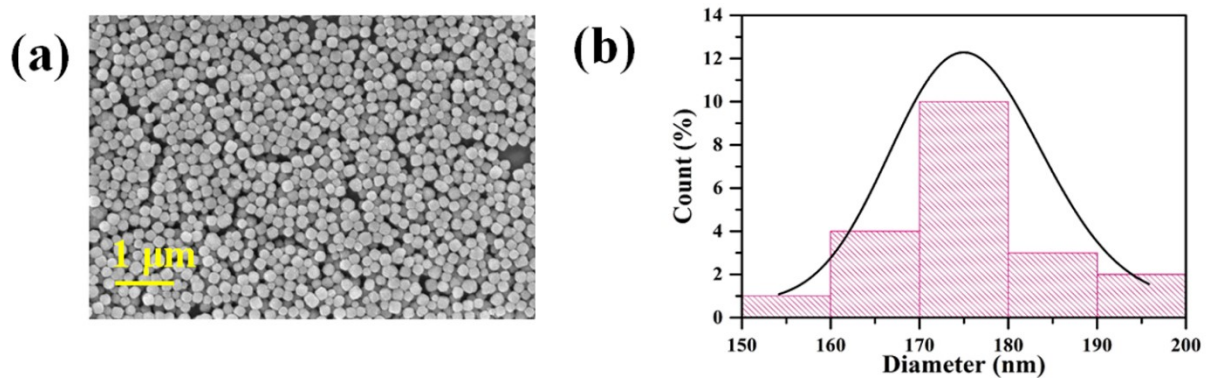


Fig. S1 (a) FESEM image of particle size distribution of SPB nanoparticles, (b) Diameter distribution of SPB nanoparticles.

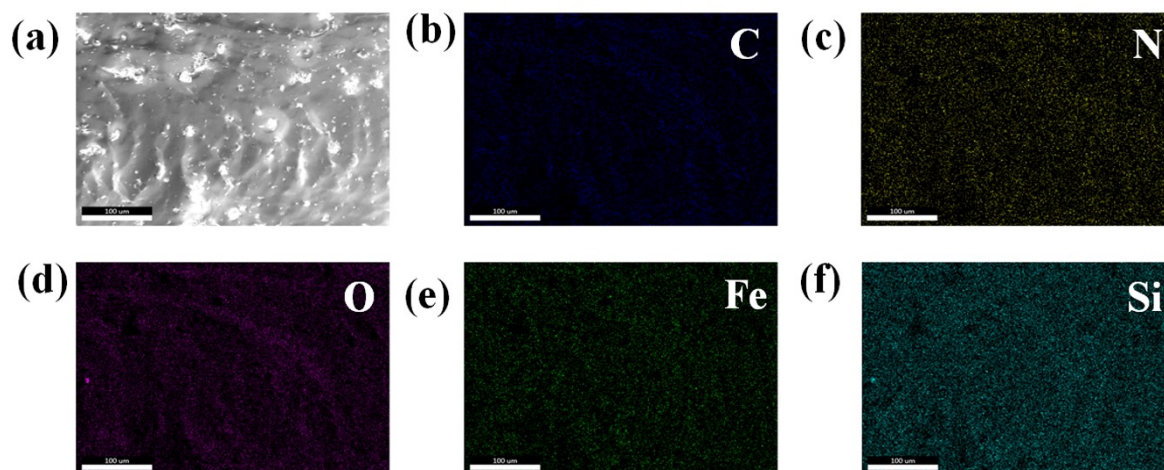


Fig. S2 EDAX mapping of the elements in synthesized PHPBR1-1 polymer nanocomposite (a) selected area, (b) C, (c) N, (d) O, (e) Fe, and (f) Si.

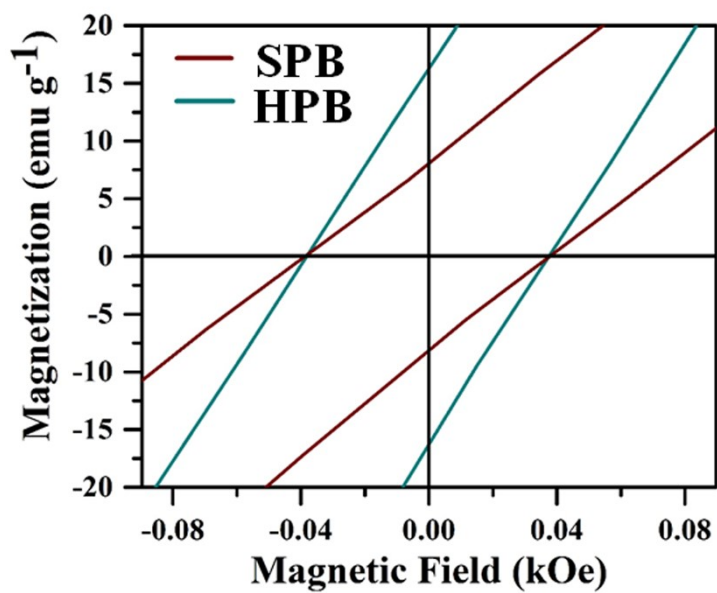


Fig. S3 Field dependence magnetization expansion within +/- 80Oe of SPB and HPB nanoparticles.

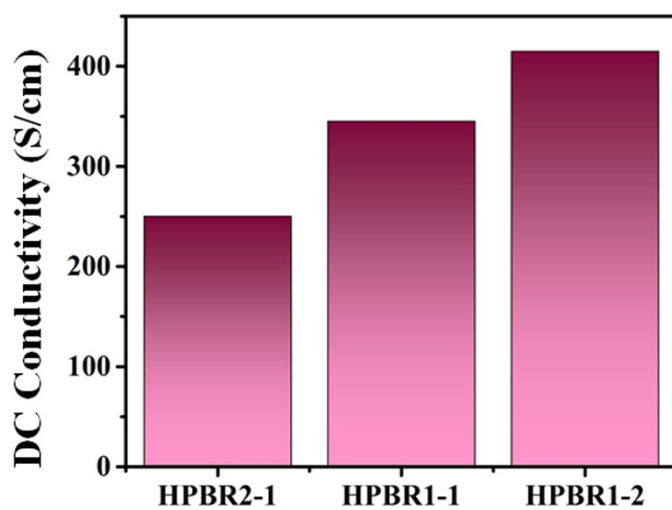


Fig. S4 DC conductivity of (a) HPBR2-1, HPBR1-1, HPBR1-2 nanocomposites.

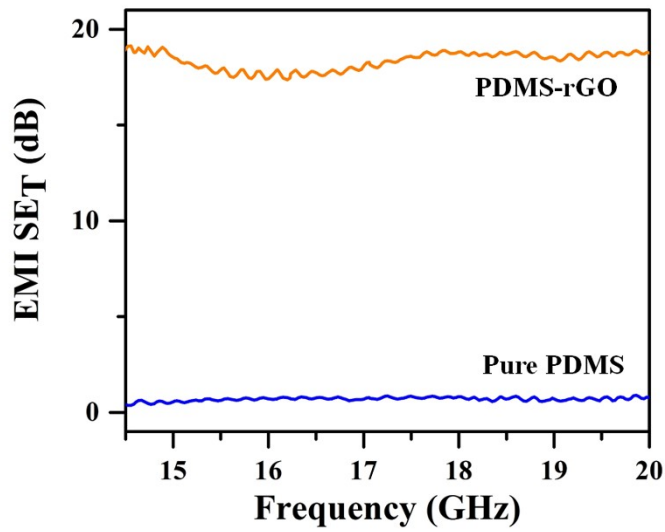


Fig. S5 Frequency-dependent EMI SE_T of pure PDMS polymer and 15 wt% rGO loaded PDMS based composite.

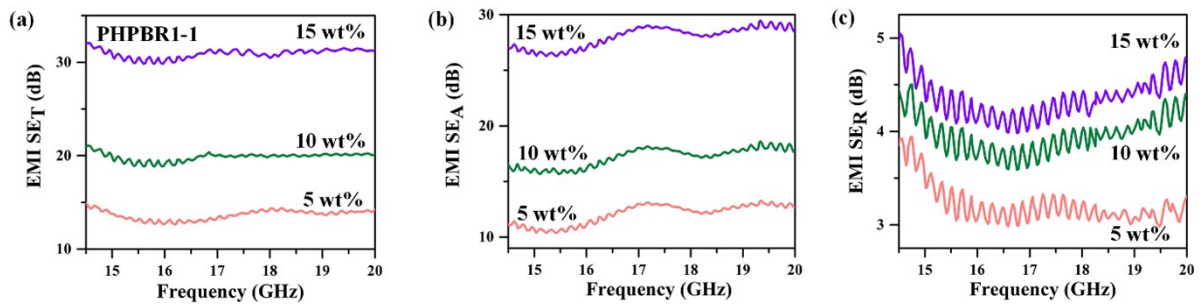


Fig. S6 Frequency-dependent (a) EMI SE_T, (b) EMI SE_A, (c) EMI SE_R of PHPBR1-1 polymer nanocomposite with different wt. % of filler (HPBR1-1) loading.

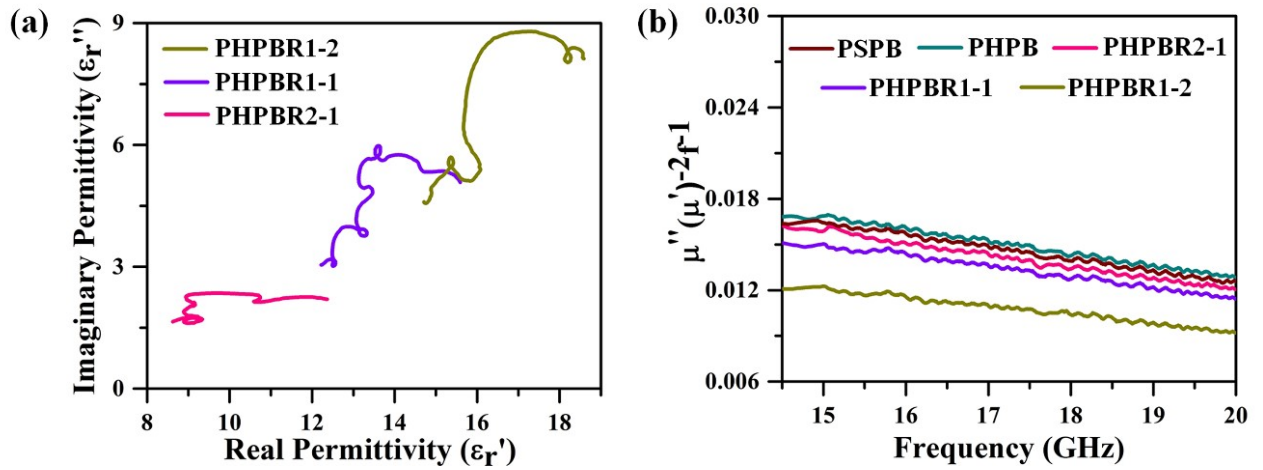


Fig. S7 (a) Cole–Cole semicircles (ϵ' versus ϵ'') of the prepared polymer nanocomposite (b)

$\mu''(\mu')^{-2}f^{-1}$ (representing eddy current loss) versus frequency of various prepared polymer nanocomposite with respect to frequency in the extended Ku-band region.