

Electronic Supplementary Information

Modulation of Electromagnetic Wave Absorption via Porosity in Pechini-derived Carbon Guided by Random Network Model

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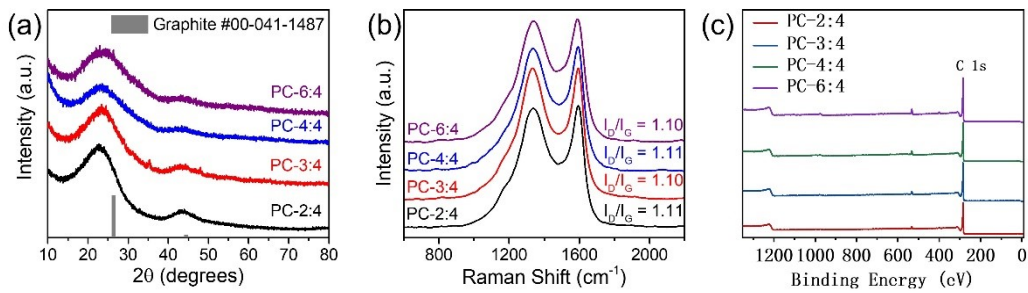


Fig. S1 (a) XRD patterns and (b) Raman spectra of PC samples, and (c) XPS spectra of all samples

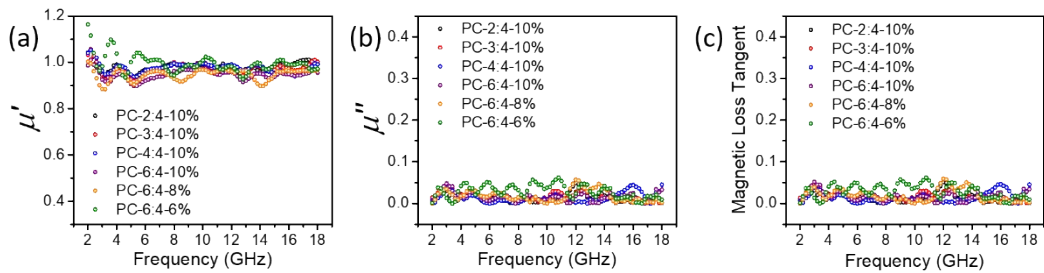


Fig. S2 (a) Real and (b) imaginary part of permeability, and (c) Magnetic loss tangent of PC samples

According to the literature, there are three prevailing quantitative metrics to describe the degree of impedance matching, namely the impedance coefficient (M_Z), the mode length of the normalized impedance ($|Z_{in}|$), and the delta function (Δ). And they can be expressed as follows.

$$M_Z = \frac{2Z'_{in}}{|Z_{in}|^2 + 1} \quad (1) \quad |Z_{in}| = \sqrt{\frac{\mu_r - 1}{\epsilon_r - 1}}$$

(2)

$$\Delta = |\sinh^2(Kfd) - M| \quad (3)$$

$$K = \frac{4\pi\sqrt{\mu'\epsilon'}}{c}$$

(4)

$$M = \frac{4\mu' \cos \delta_e \epsilon' \cos \delta_m}{(\mu' \cos \delta_e - \epsilon' \cos \delta_m)^2 + \left(\tan \frac{\delta_m - \delta_e}{2}\right)^2 (\mu' \cos \delta_e + \epsilon' \cos \delta_m)^2}$$

(5) The impedance in the above

$$\tan \delta_e = \frac{\epsilon''}{\epsilon'}$$

$$(6) \quad \tan \delta_m = \frac{\mu''}{\mu'}$$

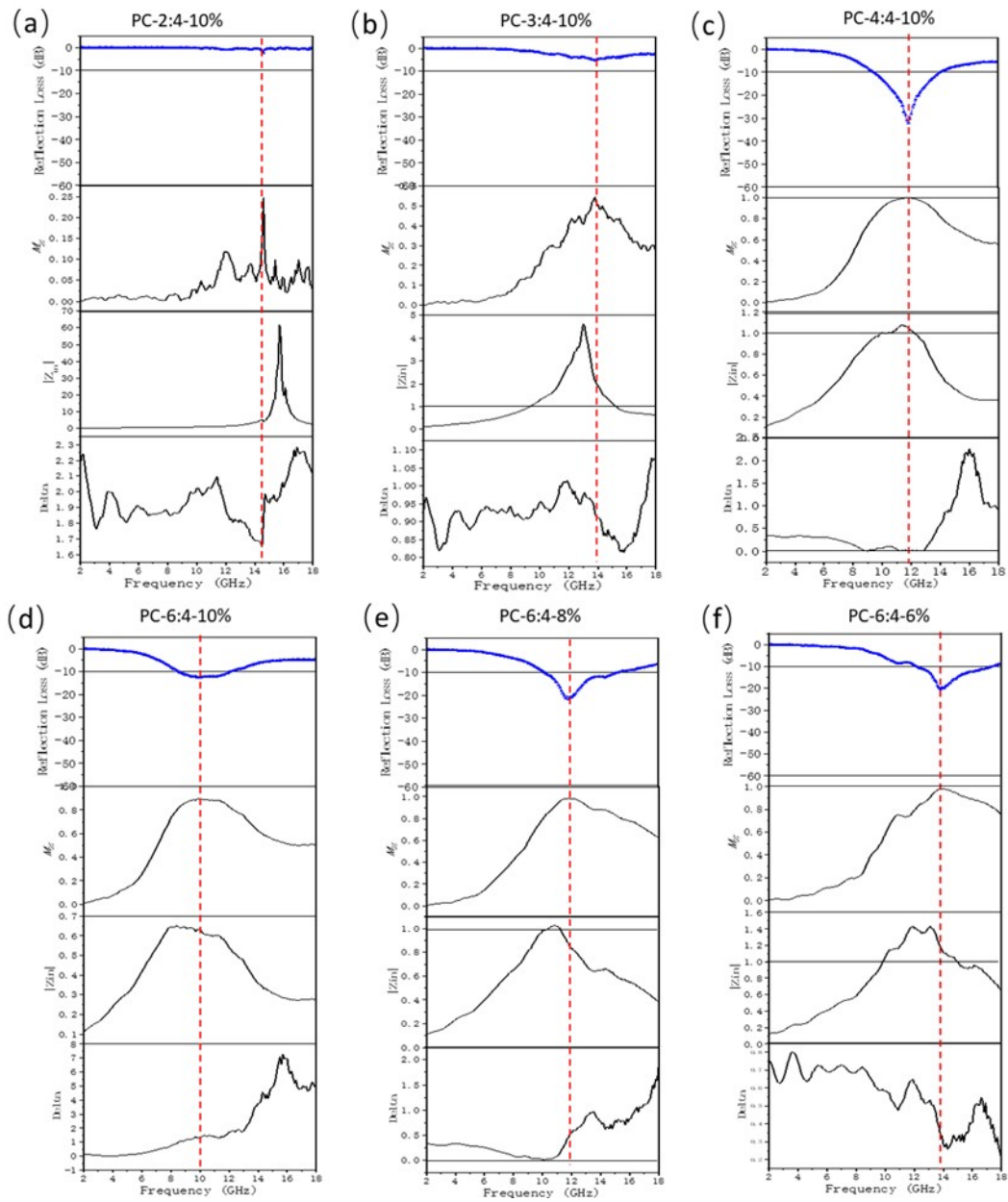


Fig.S3 Cross-sectional comparison of three impedance matching metrics using PC series samples. (a) PC-2:4-10% ;(b) PC-3:4-10%; (c) PC-4:4-10%; (d) PC-6:4-10%; (e) PC-6:4-8% and (f) PC-6:4-10%.