Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information

Microwave absorbing property optimization of starlike ZnO/reduced graphene oxide doped by ZnO nanocrystals composites

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Details of preparing graphene oxide

5g graphite powder was added to 115mL concentrated H_2SO_4 gradually in ice-bath(0 °C) and keep stiring. Then 15g $KMnO_4$ was added to the mixture with stirring gradually, and the mixture was maintained below 20°C. Then the mixture was stirred at 35°C for 30min. 230mL distilled water was added to the hybrids slowly which increased to 98°C during the process.Then the hybrids was maintained at about 98°C for 15min. Finally, 700mL distilled water and 50mL 30%H_2O_2 solution were added into the mixture subsequently to terminate the reaction. The mixture was separated by centrifugation and washed repeated with 5% HCl solution and distilled water. The seperated sediment was dialyzed for three weeks to remove unwanted ions. Then the sediment was free-dried for utilization.

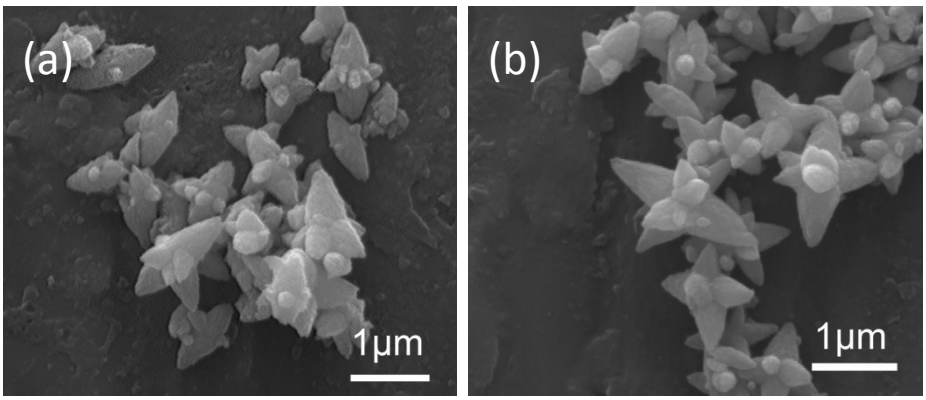


Figure S1 SEM images of C1 sample (a) and C2 sample (b)

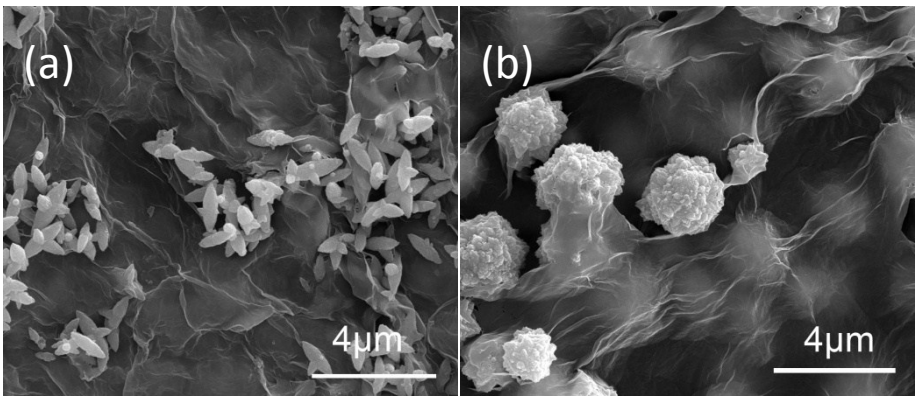


Figure S2 SEM images of P1 sample (a) and P2 sample (b)

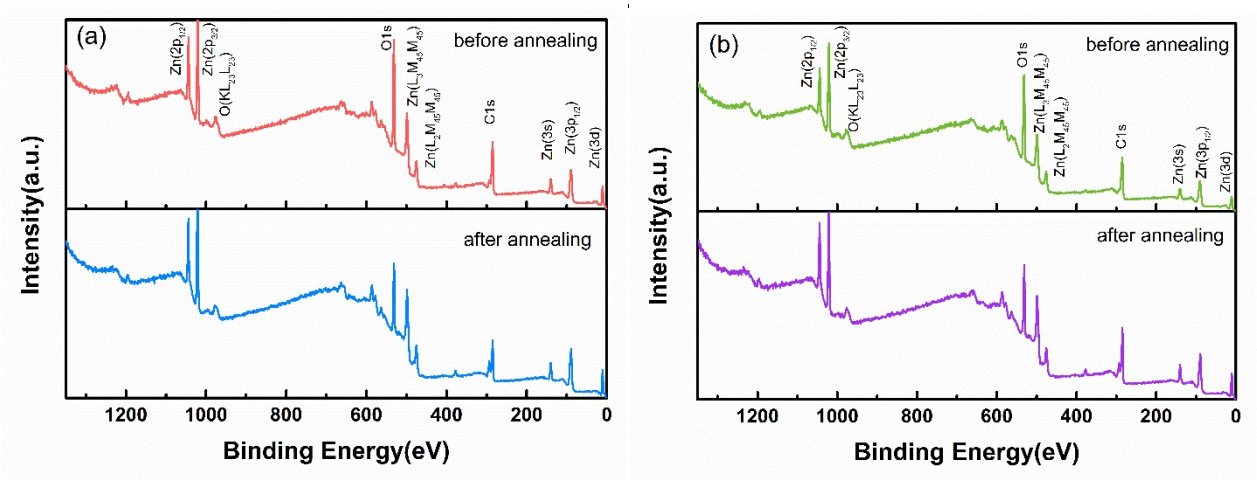


Figure S3 XPS survey scan of ZG2 (a) and ZG4 (b) sample

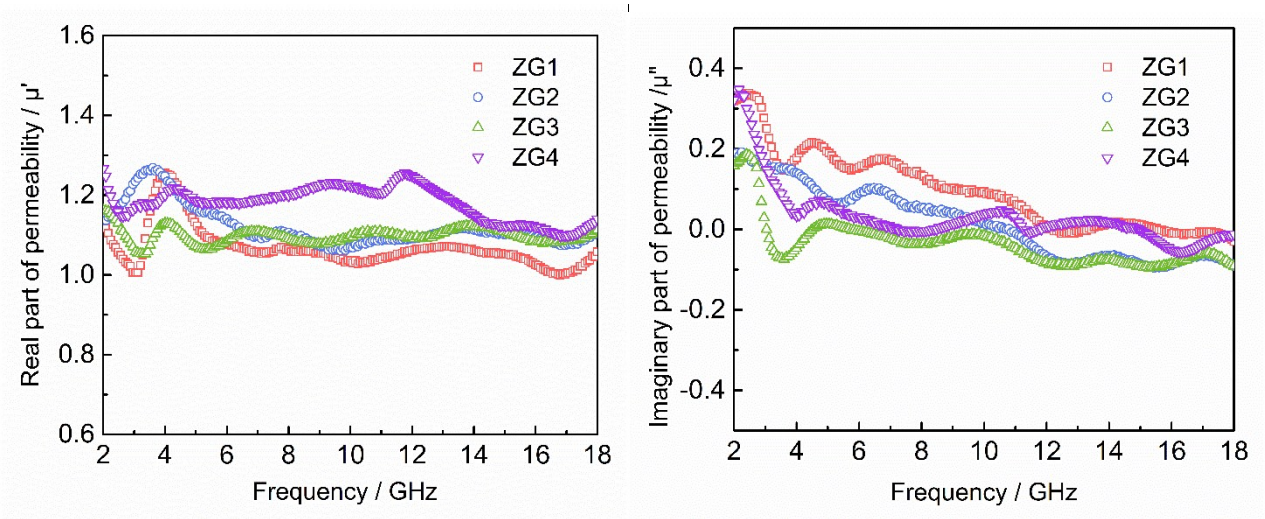
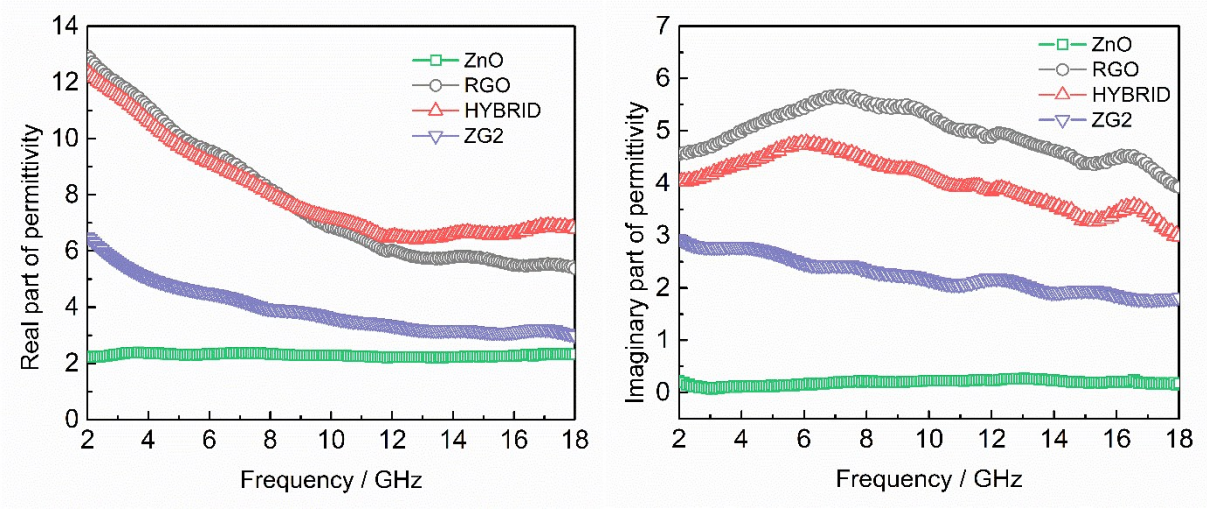


Figure S4 The real and imaginary part of permeability of ZG1-ZG4 samples



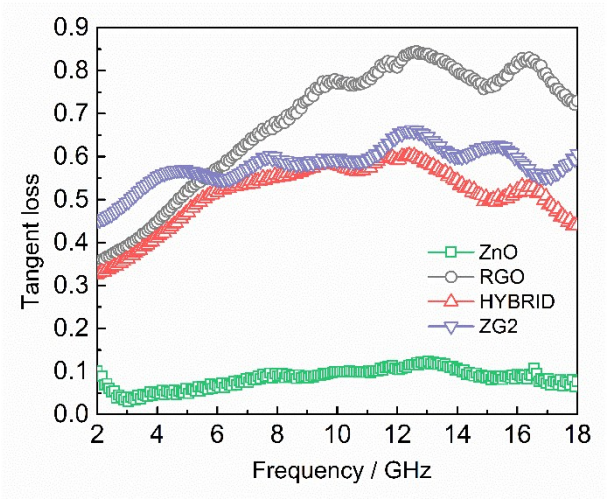


Figure S5 Frequency dependence of the real and imaginary part of permitivity and tangent loss of ZG2 sample, pure ZnO, pristine RGO and the mechanical hybrid of ZnO and RGO

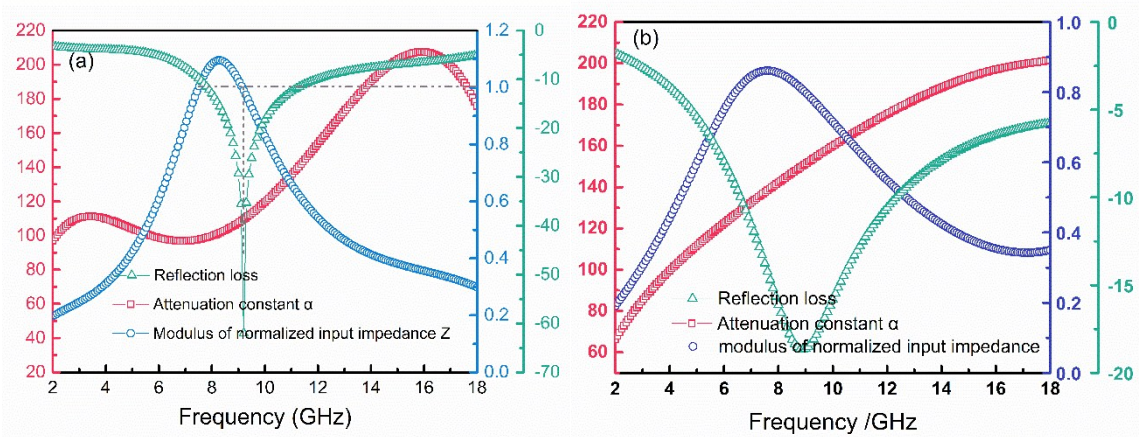


Figure S6 The frequency dependence of reflection loss, attenuation constant α and the modulus of normalized input impedance of ZG3(a) and ZG4(b) with 4.0 mm

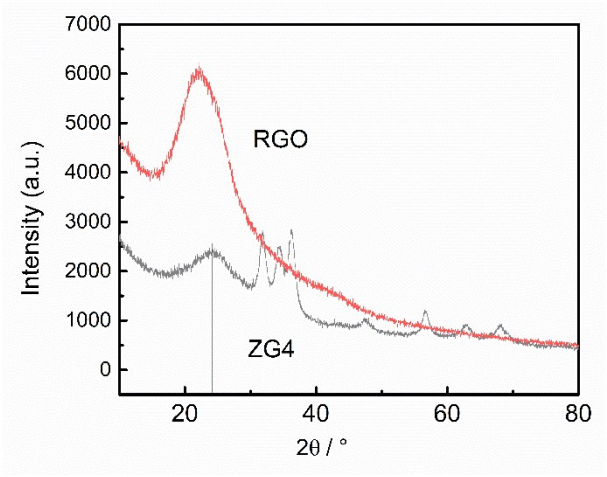


Figure S7 XRD patterns of ZG4 and pure RGO

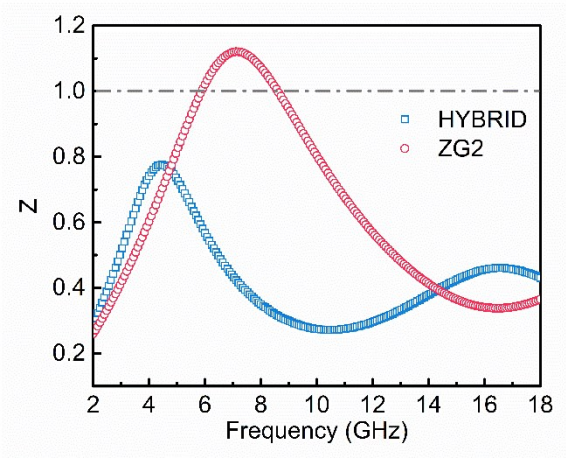


Figure S8.Frequency dependence of Z value of ZG2 and HYBRID (d=4.5 mm)

$$\alpha = \frac{\sqrt{2}\pi f}{c}\sqrt{(\mu''\varepsilon'' - \mu'\varepsilon') + \sqrt{(\mu''\varepsilon'' - \mu'\varepsilon')^2 + (\mu'\varepsilon'' + \mu''\varepsilon')^2}} \quad \text{(Equation S1)}$$