Economical Synthesis of FeNi alloy nanoparticles evenly dispersed two-dimensional reduced graphene oxide composites as thin and effective electromagnetic wave absorbers

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**Fig. S1** TG curves (a) of FeNi/rGO-2.8glu and FeNi/rGO-20 composites; SEM images of FeNi/rGO-2.8glu (b) and FeNi/rGO-20 (c) composites.

The FeNi/rGO-2.8glu and FeNi/rGO-20 composites are synthesized via the same experimental procedures except for the different dosages of glucose (2.8 mmol for FeNi/rGO-2.8glu, 7.6 mmol for FeNi/rGO-20). From Fig. S1a, it can be obviously noted that FeNi/rGO-2.8glu and FeNi/rGO-20 composites display remaining weight of 72.34% and 36.46%, respectively. The mass percentage of carbon-based materials can be accordingly calculated as 44.80% and 72.18%, respectively. The amount of carbon increases correspondingly as more glucose is added in the reaction. This indicates that the carbon formed by glucose is present in the product. Additionally, Fig. S1(b-c) both show purely two-dimensional structure for FeNi/rGO-2.8glu and FeNi/rGO-20 composites with no other morphologies. Again, it can manifest that glucose is carbonized into the amorphous carbon depositing on the surface of graphene.
Fig. S2 XRD pattern of FeNi/rGO-0glu composite without glucose.

Fig. S3 SEM (a) and TEM (b) images of FeNi/rGO-0glu composite without glucose.

Fig. S4 Typical Cole-Cole semicircles ($\varepsilon'$ versus $\varepsilon''$) for FeNi/rGO-20 (a), FeNi/rGO-60 (b) and FeNi/rGO-100 (c).