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Multi-interfacial Co@CoN$_x$@C(N) Nanocapsules with Nitrogen Substitutions in Graphitic Shells for Improving Microwave Absorption Properties

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ABSTRACT: Integrating multiple components with heterogeneous interfaces has been widely proven effective for optimizing the microwave absorption properties of composites. We herein report on an arc-discharging strategy to synthesize the onion-like Co@CoN$_x$@C(N) nanocomposite with dual core@shell heterogeneous interfaces. The graphitic carbon shells are in-situ functionalized by nitrogen substitutions, resulting in the formation of pyridinic, pyrrolic and graphitic nitrogen substitutions. Such a structural configuration contributes to a significant enhancement in dielectric loss capacity, presenting three main attenuation peaks at the frequencies of 6.6 GHz, 13.5 GHz and 17.1 GHz, respectively. The