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Magnetic, Electrically Conductive and Lightweight Graphene/Iron Pentacarbonyl Porous Films Enhanced with Chitosan for Highly Efficient Broadband Electromagnetic Interference Shielding

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ABSTRACT: Highly efficient and lightweight electromagnetic interference (EMI) shielding materials have gained tremendous interests due to the urgent requirement for smart electronic devices and aerospace applications. Herein, we demonstrate a highly efficient hydrazine-induced foaming approach to fabricate magnetic, highly electrically conductive, and lightweight graphene/iron pentacarbonyl (IP) porous films for broadband EMI shielding application. The chitosan introduced effectively optimizes the microcellular structures by improving the interfacial adhesion between graphene sheets and thus enhances the electrical conduction of the porous films with IP flakes. The resultant porous structure not only reduces the density of the films, but also improves the electromagnetic radiation attenuation by repeated scattering of the incident microwave. The presence of magnetic IP flakes endows the magnetically responsive film with enhanced EMI shielding performance by combining the dielectric and magnetic losses. Thus, the

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