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Ultra-light carbon nanotube sponge as an efficient electromagnetic shielding material in the GHz range MARIA CRESPO, Pennsylvania State Univ;Universidad Carlos III, MARIA GONZÁLEZ GONZÁLEZ, Universidad Carlos III, LAKSHMY PULICKAL RAJUKUMAR, ANA LAURA ELIAS, Pennsylvania State Univ, JUAN BASELGA, Universidad Carlos III, MAURICIO TERRONES, Pennsylvania State Univ, JAVIER POZUELO, Universidad Carlos III — A CVD-synthesized CNT flexible sponge, with density lower than 0.02 g cm^{-3}, has been found to serve as high performance EMI shielding material without the aid of any polymer infiltration or impregnation. Due to its extreme lightweight, the specific SE of the CNT-sponge was found to be as high as 1100 dB cm^3 g^{-1}, having a total SE above 20 dB in the whole 1–18 GHz range, and being able to shield by absorption. The material is the best of our knowledge this specific SE value appears to be the highest reported hitherto. Improved EM absorbers should fulfill the synergic requirements of being low reflective and highly absorptive. In our CNT-sponges this condition is not satisfied because, although their net absorption ability is strongly remarkable, their high electrical conductivity favors the wave to be reflected at the input interface. Therefore, this sponge material would have a great potential for microwave-frequency applications that need negligible reflection and great absorption when combined in a multilayered structure that could prevent the wave to be reflected at the input interface.

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