

Ultra-Fast Heat Dissipating Aerogels Derived from Polyaniline Anchored Cellulose Nanofibers as Sustainable Microwave Absorbers

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Abstract

Electromagnetic (EM) pollution is ubiquitous and has soared to a great extent in the past few decades. The use of plant sourced cellulose nanofibers to fabricate sustainable and high performance electromagnetic shielding materials is foreseen as a green solution by the electronics industry to address this unseen pollutant. In this view, we report a facile and environmentally benign strategy to synthesize ultra-light and highly conductive aerogels derived from cellulose nanofibers (CNF) decorated with polyaniline (PANI) via a simple in-situ polymerization and subsequent freeze drying process devoid of any volatile organic solvents. The obtained conductive aerogels exhibited density as low as 0.01925 g/cc with a maximum EMI shielding value -32 dB in X band region. These porous shields demonstrated strong microwave absorption behavior (95%) with minimal reflection (5%) coupled with high specific EMI SE value $\sim 1667 \text{ dB.cm}^3.\text{g}^{-1}$ which make these aerogels a potential candidate for use in telecommunication, military and defense applications.

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Biography

Sabu Thomas was born on 14 March 1962. He Studied Pre-Degree at CMS College, Kottayam and then obtained BSc Degree in Chemistry from Kuriakose Elias College,

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