Fw: 【SCMs-2025-1101】Just Accepted Manuscript for Aug 22, 2025

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主题：【SCMs-2025-1101】Just Accepted Manuscript for Aug 22, 2025

Just Accepted Alert

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Dear Prof. Peiyuan Zuo

It is a pleasure to tell you that your manuscript entitled "Enhancing interfacial bonding and compositional synergy in ANF-PPy/Ag-MXene/ANF-PPy multilayer heterostructures for efficient electromagnetic interference shielding and infrared thermal camouflage" is now available on the "Just Accepted" Web site in the "SCIENCE CHINA Materials". To access just the manuscript directly, click the link below:

http://engine.scichina.com/doi/10.1007/s40843-025-3664-x

Sincerely yours,

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Enhancing interfacial bonding and compositional synergy in ANF-PPy/Ag-MXene/ANF-PPy multilayer heterostructures for efficient electromagnetic interference shielding and infrared thermal camouflage

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Speciality:	Optoelectronic Materials

Enhancing interfacial bonding and compositional synergy in ANF-PPy/Ag-MXene/ANF-PPy multilayer heterostructures for efficient electromagnetic interference shielding and infrared thermal camouflage

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Abstract

The development of multifunctional electronic information materials that combine electromagnetic interference (EMI) shielding and infrared (IR) thermal camouflage is crucial for the smooth and safe operation of electronic devices. However, it is challenging for traditional shielding materials to simultaneously meet these high demands. Here, based on the strategy of interfacial bonding and compositional synergy, we successfully prepared a multilayer ANF-PPy/Ag-MXene/ANF-PPy composite film via layer-by-layer vacuum filtration combined with a hot-pressing process using modified aramid nanofibers and MXene nanosheets as substrates. The film features ANF/PPy as the matrix and Ag-MXene as the functional filler, and its unique multilayer structure enables it to generate multiple losses during electromagnetic wave transmission. In addition, the in-situ grown Ag nanoparticles effectively extend the MXene layer spacing and significantly enhance electromagnetic wave scattering efficiency. The film with a thickness of only 33 μm exhibits excellent EMI shielding performance (average EMI SE of 66.75 dB and SSE/t of 38432.54 dB·cm^2/g). The tight integration of the multilayer structures also endows their high IR reflectivity. Accordingly, this research lays the foundation for the creation of multifunctional protective materials that have great potential for both military and civilian purposes.

Keywords: Aramid nanofiber; MXene ($Ti_3C_2T_x$); Electromagnetic interference shielding; Environmental stability; infrared thermal camouflage