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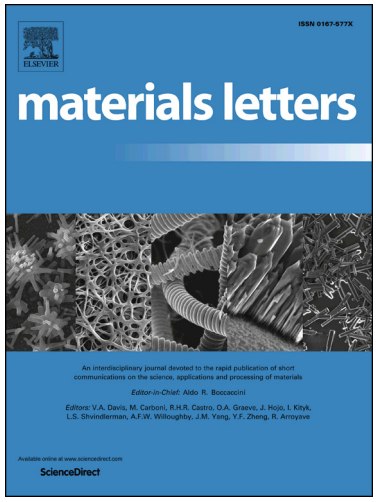

Au-Decorated SWNT/PVDF Electrospun Films with Enhanced Infrared Stealth Performance

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Au-Decorated SWNT/PVDF Electrospun Films with Enhanced Infrared Stealth Performance

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ABSTRACT

Fibrous membranes with low infrared emissivity hold promises in applications as infrared stealth uniforms, backpacks and tents due to their lightweight, flexibility and versatility, etc. By electrospinning technology, fibrous membranes of polyvinylidene fluoride (PVDF), and PVDF modified with single-wall carbon nanotubes (SWNT) (named as SWNT/PVDF) are prepared. The membranes of PVDF and SWNT/PVDF are further decorated with Au nanoparticle, and are named as Au-PVDF and Au-SWNT/PVDF. The infrared emissivity of the films is characterized at the range of 2-22 μm wavelengths. The infrared emissivity value is in the descending order, being 0.82, 0.77, 0.76, and 0.68 for PVDF, SWNT/PVDF, Au-PVDF, and Au-SWNT/PVDF films. The results indicate the effectiveness of Au decoration on the reduction of infrared emissivity for PVDF or SWNT/PVDF fibrous membranes, rendering its probable application in infrared stealth camouflage.

Keywords: fibrous membranes; Infrared emissivity; PVDF; carbon nanotubes

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