

Nanomaterials for infrared shielding smart coatings

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Abstract	<p>Synthesis and characterization of functional nanoparticles and their applications for smart window are reviewed. Various kinds of nanomaterials and their composites are successfully synthesized by solvothermal process. Thin films on glass substrate can be fabricated by doctor blade method using nanoparticles as starting materials. The mixed valence state tungsten-based homogeneous nanomaterials possess excellent infrared (IR) light shielding properties, implying their potential applications for the heat ray shielding and indoor energy saving effect in summer. On the other hand, VO₂ monoclinic-based nanoparticles possess smart and excellent thermochromic properties, show excellent heat ray shielding effect in summer and heating effect of winter indoors. Also, multifunctionality of thin films can be realized by fabricating the composites with various functional components, implying their potential applications for IR shielding, photocatalysis and self-cleaning at the same time. The design of composites and structure of thin films might result in the enhancement or properties of practice applications on window materials.</p>
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