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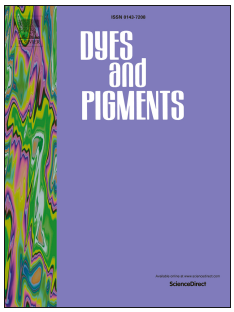

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Color Performance and Near Infrared Reflectance Property of Novel Yellow Pigment Based on Fe_2TiO_5 Nanorods Decorated Mica Composites

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Abstract: To obtain cool yellow pigments with high near-infrared reflectance, mica/ Fe_2TiO_5 composite pigments were synthesized by a chemical liquid deposition method. The developed composite pigment powders were characterized by X-ray diffraction (XRD), scanning electronic microscopy (SEM), X-ray photoelectron spectroscopy (XPS) , UV–vis–NIR diffuse reflectance spectra, and CIE*L*a*b** color scales. Different sized Fe_2TiO_5 nanorods were coated on the surface of mica particles. The particle size of the nanorods increased with increasing molar ratio of Fe^{3+} to Ti^{4+}. The obtained composite pigments showed strong ultraviolet shielding ability and high near-infrared reflectance property. What's more, the Fe_2TiO_5 coating with smaller particle size possessed higher reflectance in the region of 700～1500nm in accordance with the Kubelka-Munk theory. The near-infrared solar reflectance of mica/ Fe_2TiO_5 composites was as high as 80.3%. An approximately 3 °C decrease in interior temperature was obtained for the heat box coated with the composite pigments. Furthermore, the composite pigments exhibit brilliant yellow colors. Therefore, mica/ Fe_2TiO_5 composites are excellent near infrared reflective yellow pigments for efficient solar reflective coatings.