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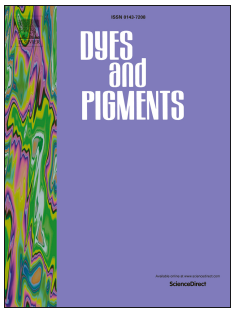

Environmentally friendly orange pigments based on hexagonal perovskite-type compounds and their high NIR reflectivity

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Environmentally Friendly Orange Pigments Based on Hexagonal Perovskite-Type Compounds and Their High NIR Reflectivity

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Keywords: Inorganic orange pigment, Environmentally friendly, Hexagonal perovskite 2H, Solid-state reaction method, High NIR reflectance, Energy-saving materials

Abstract

Novel environmentally friendly inorganic orange pigments based on the hexagonal perovskite-type pigment $Sr_4Mn_2(Cu_{1-x}Zn_x)O_9$ ($0 \leq x \leq 1$) were synthesized and their optical and color properties were determined. Using Zn^{2+} doping (x = 0.5), the optical absorption caused by a ligand-metal charge transfer transition was reduced due to anisotropic lattice distortion, while the optical absorption corresponding to the d-d transition of Cu^{2+} was clearly observed at 670 nm. As a result, the $Sr_4Mn_2(Cu_{0.5}Zn_{0.5})O_9$ sample possessed a brilliant orange color with L^*, a^*, b^*, C, and $H°$