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Broadband Thermochromic VO₂-based Composite Film with Ultra-High Solar Modulation Ability

Fang Xu,^{a,b,c} Xun Cao,^{a,b,*} Jingting Zhu,^d Guangyao Sun,^{a,b,c} Rong Li,^{a,b} Shiwei Long,^{a,b,c} Hongjie Luo,^e Ping Jin^{a,b,f,*}

^a State Key Laboratory of High Performance Ceramics and Superfine Microstructure, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, 200050, China.

^b Research Center for Industrial Ceramics, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai 200050, China

^c University of Chinese Academy of Sciences, Beijing 100049, China

^d Collaborative Innovation Center for Optoelectronic Science & Technology, International Collaborative Laboratory of 2D Materials for Optoelectronics Science and Technology of Ministry of Education, College of Optoelectronic Engineering, Shenzhen University, Shenzhen 518060, China

^e School of Materials Science and Engineering, Shanghai University, 99 Shangda Road, Shanghai 200444, China

^f Materials Research Institute for Sustainable Development, National Institute of Advanced Industrial Science and Technology, Nagoya 463-8560, Japan

Corresponding authors :

(X. Cao)E-mail: caoxun2015@gmail.com

(P. Jin)E-mail: p-jin@mail.sic.ac.cn

Abstract

It is a long-standing challenge to surmount the relatively low solar regulation ability in VO₂-based smart window coatings. Here, we hybridize VO₂ with a Ni^{II}-I-TMP complexes and then fabricate a novel composite VO₂/NIT film. The composite film shows a ultra-high solar modulation efficiency ($\Delta T_{\text{sol}} = 27.3\%$), relatively high luminous transmittance ($T_{\text{lum,l}} = 61.3\%$ and $T_{\text{lum,h}} = 36.2\%$) and visible color modulation ability. Our novel broadband modulation composite film exhibits superior application potential in smart window application.

Key words: thermochromic; vanadium dioxide; ligand exchange system; composite film; smart window; broadband modulation;

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