

Supporting Information

TiO₂ seed-assistant growth of VO₂(M) films and thermochromic performance

Li Zhong,^{a,b} Yuanyuan Luo,^a Ming Li,^a Yuyan Han^c Hua Wang,^{a,b} Sichao Xu^a and Guanghai Li^{a,b,*}

^aKey Laboratory of Materials Physics, Anhui Key Laboratory of Nanomaterials and Nanotechnology, Institute of Solid State Physics, Chinese Academy of Sciences, Hefei 230031, P. R. China.

^bSchool of Chemistry and Materials Science, University of Science and Technology of China, Hefei 230031, P.R. China.

^cHigh Magnetic Field Laboratory, Chinese Academy of Science, Hefei 230031, P. R. China.

*Corresponding author: ghli@issp.ac.cn,

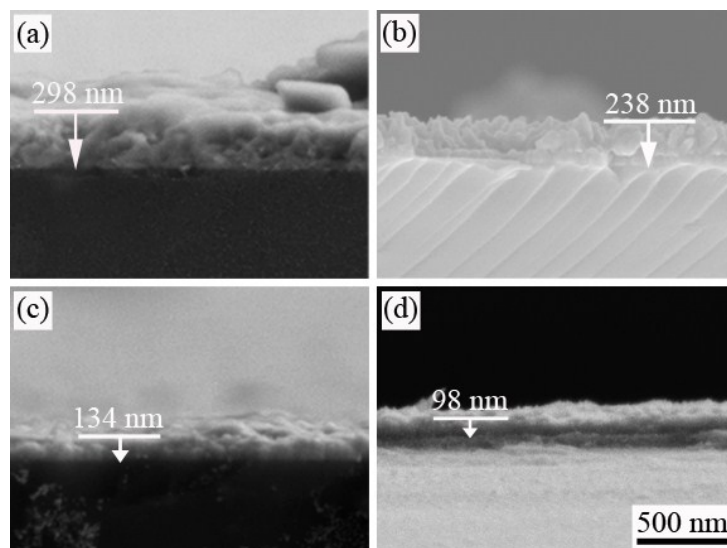


Fig. S1 Cross section FESEM images of as-prepared composite films: (a) sample I, (b) II, (c) III and (d) IV.

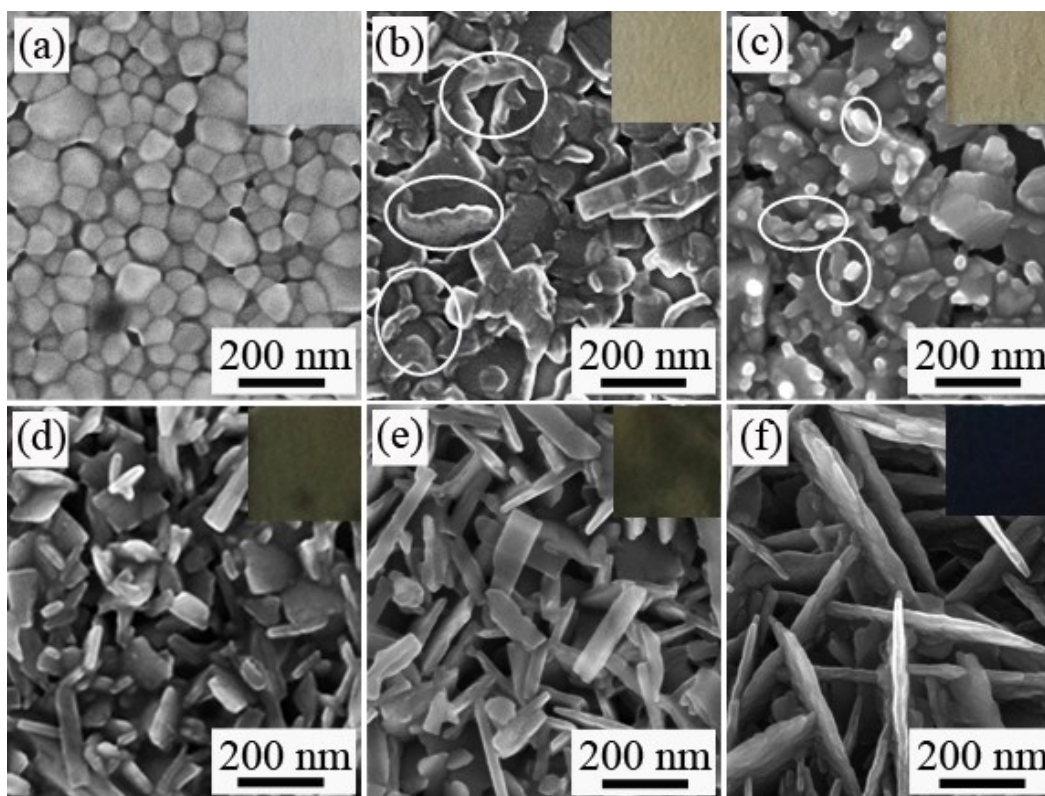


Fig. S2 FESEM images of VO_2/TiO_2 composite film obtained at the reaction time of (a) 0, (b) 13, (c) 16, (d) 18, (e) 21, and (f) 26 h. The insets are the optical photography of the corresponding film.

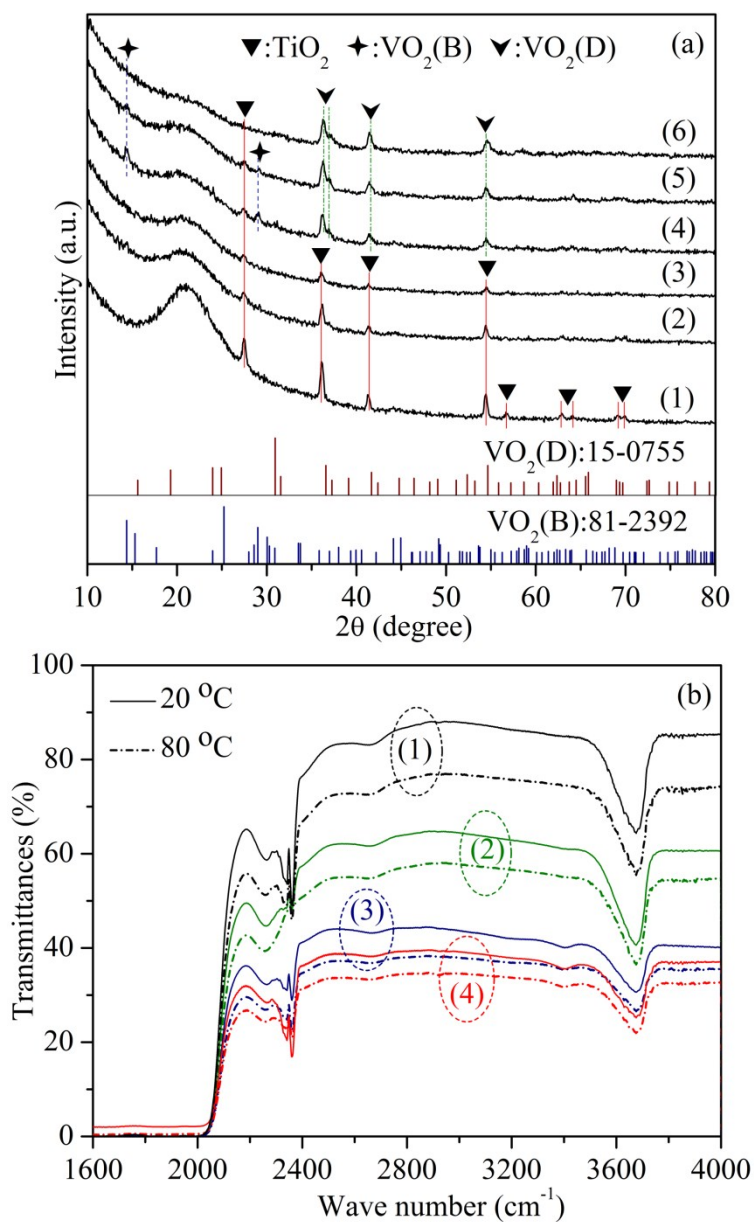


Fig. S3 (a) XRD patterns of VO_2/TiO_2 composite film obtained at the reaction time of (1) 0, (2) 13, (3) 16, (4) 18, (5) 21, and (6) 26 h, and (b) variable-temperature FT-IR spectra of the as-prepared VO_2/TiO_2 composite films at reaction time of (1) 13, (2) 16, (3) 18 and (4) 21 h. The $\text{VO}_2(\text{B})$ diffraction peaks in curves (4) and (5) in Fig. S3a at the reaction time of 18 and 21 h is considered come from the solution that attaches on the surface of $\text{VO}_2(\text{D})$ film.

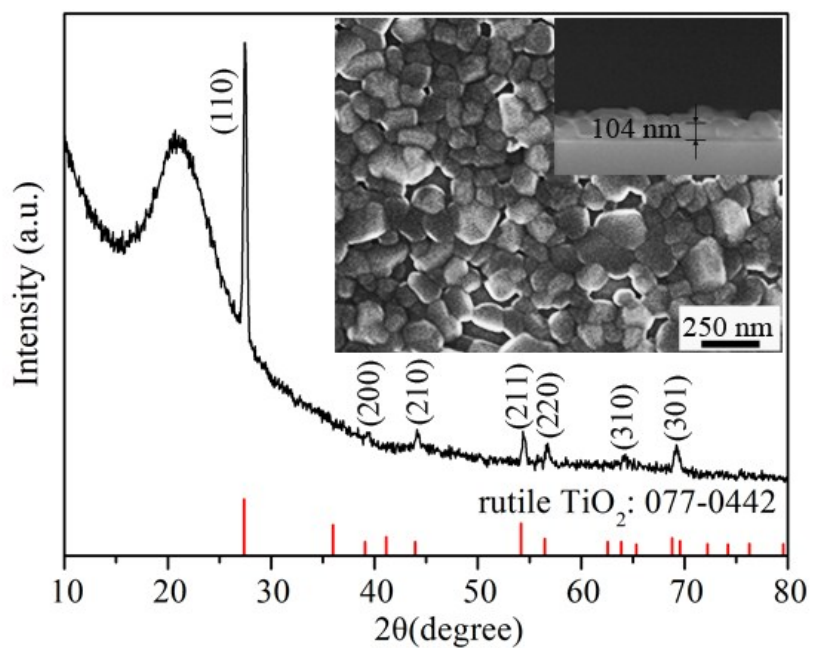


Fig.S4 XRD pattern of TiO_2 seed layer with [110] preferential orientation on quartz substrate. The insets are corresponding surface and cross section FESEM images.

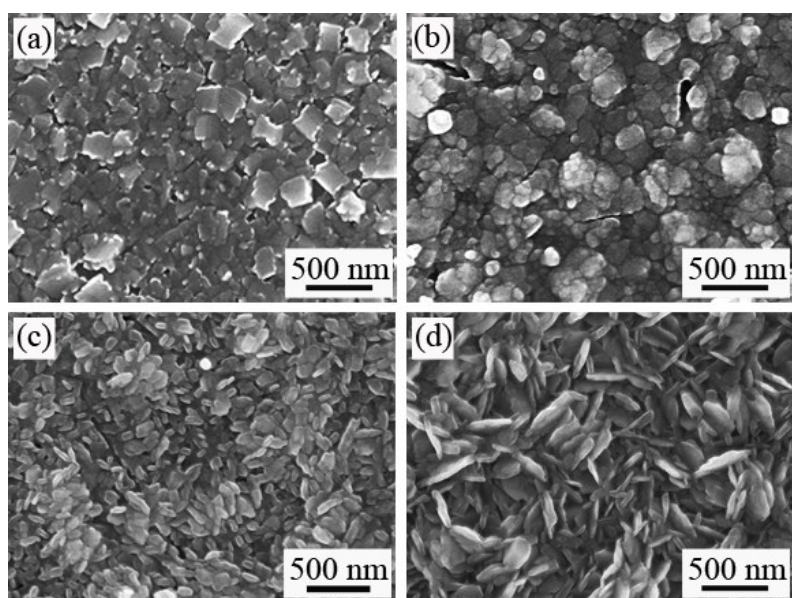


Fig.S5 FESEM images of VO_2/TiO_2 composite film at the reaction time of (a) 10, (b) 10.5, (c) 11 and (d) 13 h on [110] preferential orientation rutile TiO_2 seed layer.

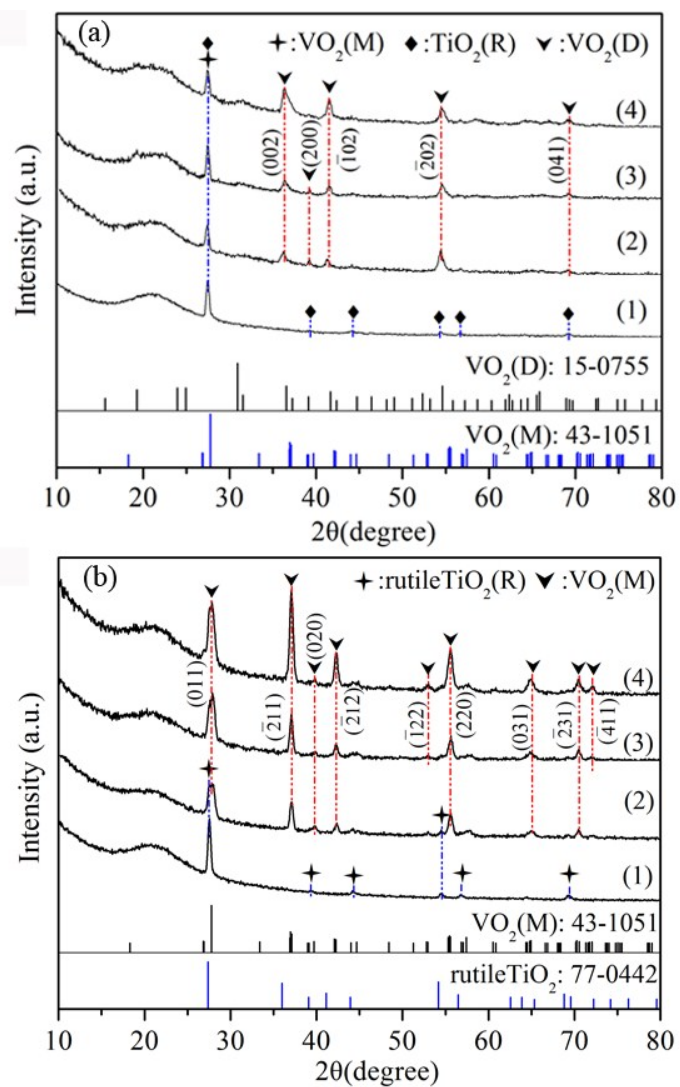


Fig.S6 XRD patterns of VO₂/TiO₂ composite film obtained at the reaction time of (1) 10, (2) 10.5, (3) 11 and (4) 13 h before (a) and after (b) annealing treatment grown on [110] preferential orientation rutile TiO₂ seed layer.

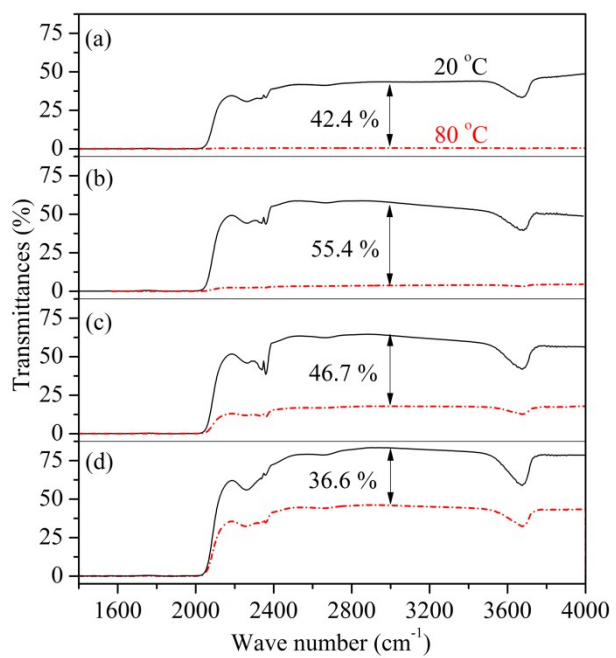


Fig. S7 Variable-temperature FT-IR spectra of VO₂(M)/TiO₂ composite films before and after phase transition with the thickness of (a) 298, (b) 238, (c) 134 and (d) 98 nm.