

Preparation of W-Mo co-doped VO₂(M) for application as energy-saving smart coatings

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Monoclinic-type structure VO₂(M) has attracted much attention because its reversible phase transition at about 68°C, which makes it useful for application in various areas, such as optical switching devices and intelligent energy conserving windows coating. Furthermore, The reduction of the phase transition temperature of VO₂(M) to near the suitable temperature is essential in most practical applications. The phase transition temperature can be reduced by doping with W, Mo, F and etc. in the previous studies, single W-doped VO₂ have been investigated to reduce transition temperature, but single W-doped VO₂ reveals drastic T_c shifts with less dopant concentration so it is hard to adjust T_c to the desired temperature. However co-doping of two single metals into VO₂ is make it possible to adjust T_c finely.

In this study, XRD patterns of W-Mo co-doped VO₂ matches well with the monoclinic VO₂(M) and it shows that the dopant almost had no influence on the VO₂ crystal structure. DSC analyses displayed that the T_c of VO₂ can be adjusted finely with various concentrations of Mo and W. The morphology and size of the W-Mo co-doped VO₂ were confirmed by the TEM.