Electronic Supplementary Material (ESI) for CrystEngComm

Template-free hydrothermal synthesis of VO_2 hollow microspheres

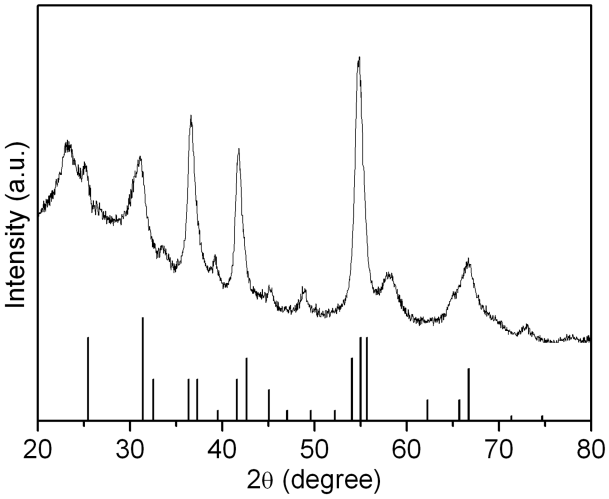

Fig. S1 Observed X-ray diffraction data of the as-obtained VO_2 and that from JCPDS No. 23-1446 for orthorhombic TiO_2

Figure S1 shows the close resemblance of the XRD pattern of orthorhombic TiO_2 to the Observed X-ray diffraction pattern of the as-obtained product, indicating that these two materials possess a similar crystal structure. The crystallographic lattice constants, crystallographic planes and *d*-values were calculated using X'Pert HighScore according to the XRD data of the hollow microspheres and the borrowed corresponding TiO_2 crystallographic phase (JCPDS No. 23-1446), and the results are summarized in Table S1. Based on these data, it is concludes that the formula for our vanadium oxide can be written as VO_2 from the crystallographic perspective.

Table S1 Summary of the experimental *d*-values calculated according to the TiO_2 crystallographic phase (JCPDS No. 23-1446) for the hollow microspheres and theoretical *d*-values from JCPDS No. 23-1446.

(hkl)	Experimental *d*-value (Å)	Theoretical *d*-value (Å)
(110)	3.539	3.500
(111)	2.884	2.850
(020)	2.664	2.750
(002)	2.451	2.470
(200)	2.299	2.280
(102)	2.160	2.170
(112)	2.008	2.010
(022)	1.864	1.837
(202)	1.674	1.668
(131)	1.588	1.593
(311)	1.405	1.401
(302)	1.296	1.321

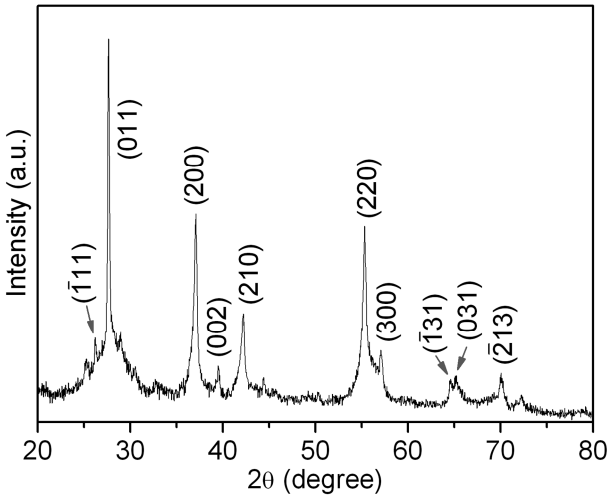

Fig. S2 X-ray diffraction pattern of the as-obtained vanadium oxide compound annealed at 500 ^{o}C for 5 hrs.

When the as-obtained samples annealed at 500 ^{o}C for 5 hrs in vacuum the amorphous background disappeared and the XRD peaks become sharp, in which all the diffraction peaks can be indexed to monoclinic VO_2 (Fig. S2, JCPDS No. 82-0661 with space group: P21/m). This result provides further evidence that the as-obtained vanadium oxide compound is VO_2.