Comments

Reply to "Comment on Precursor Morphology Controlled Formation of Rutile VO_2 Nanorods and Their Self-assembled Structures"

In the paper "Precursor Morphology Controlled Formation of Rutile VO_2 Nanorods and Their Self-Assembled Structures" (*Chem. Mater.* **2002**, *14*, 5053), we reported the rational synthesis of one-dimensional VO_2 nanomaterials through the controlled transformation from their hydrate precursors. Our use of a somewhat confusing description of the crystal structure of the VO_2 produced was the subject of a recent comment by Malavasi.[1]

As a number of VO_2 polymorphs exist it is important to describe precisely the structure of the product. Malavasi's comment pointed out that our VO_2 product has the monoclinic structure, not which is of the rutile form but which is of course tetragonal. Largely, the problem in describing the structure of VO_2 arises from the fact that this material exists in both structure types in different temperature ranges. It is well-known that VO_2 is monoclinic (which is a distorted form of the tetragonal rutile structure) at room temperature and transforms to the tetragonal rutile form at ~ 60 °C. In our Figure 4 is shown the X-ray diffraction pattern of our VO_2 product which is indexed in accord with JCPDS 9-142. Malavasi points out that this file corresponds to the monoclinic form which is correct, although the figure is labeled "Rutile VO_2". In order to avoid further misunderstanding we agree that our product should be described as monoclinic VO_2 or distorted rutile VO_2 rather than "rutile VO_2". In Supporting Information we show a resistance-temperature curve for our VO_2 which demonstrates clearly that the material is semiconducting at low temperatures and a reversible phase transition occurs at ~55 °C. This is further evidence that our as-prepared VO_2 is the monoclinic form. Finally, we wish to observe that there exists an error in the Supporting Information which accompanies Malavasi's comment. It is stated that JCPDS 70-2298 is that for the tetragonal rutile form of VO_2, whereas it is that for thallium lead chloride instead.

Experimental Information. The as-prepared VO_2 hydrate was synthesized according the paper.[2] The sample was heated at 400 °C for 24 h in a flowing N_2 atmosphere for dehydration, and the color of the products changes from pink to black. Then the black powder was pressed into pellets for electrical resistance measurement. Resistance measurements were performed using the ac four-probe method with an ac resistance bridge system (Linear Research, Inc., LR-700P).

Supporting Information Available: The resistance−temperature curve of the monoclinic rutile VO_2 nanorods we synthesized (PDF). This material is available free of charge via the Internet at http://pubs.acs.org.

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(1) Malavasi, L. *Chem. Mater.* **2006**, *18*, 2774.

(2) Gui, Z.; Fan, R.; Mo, W.; Chen, X.; Yang, L.; Zhang, S.; Hu, Y.; Wang, Z.; Fan, W. *Chem. Mater.* **2002**, *14*, 5053.

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