# Solvothermal approach of synthesizing vanadium oxide nanostructures for smart window applications

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Vanadium dioxide (VO2) has attracted attention because it is known to undergo a reversible, thermally induced metal semiconductor phase transition. Its optical properties change in the visible and near IR range at its phase transition temperature. As the temperature exceeds TC, it goes through structural change and becomes less transparent and more reflective, preventing thermal radiation from excessively heating. This phenomenon can be applicable to smart window applications. We are developing solution-phase synthetic routes, including solvothermal processes, to organically functionalized vanadium oxide nanoparticles in order to use them to fabricate nanostructured thin films. As prepared vanadium oxide nanoparticles have been characterized by means of transmission electron microscopy(TEM), scanning electron microscopy(SEM), power X-ray diffraction(XRD), Fourier transform infrared absorption spectroscopy(FTIR), and X-ray photoelectron spectroscopy(XPS). Structural and spectroscopic characterizations on the formation of vanadium oxide nanoparticles as well as the effects of reaction condition will be discussed.