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

정유홍, 정성욱†
부산대학교
(sungwook.chung@pusan.ac.kr†)

Vanadium oxide represents an important class of materials employed in different technological applications such as intelligent window coating materials and electrical, optical switching devices. Vanadium dioxide (VO2) has attracted much attention because it is known to undergo a reversible, thermally induced metal semiconductor phase transition. The outcome of this phase transition is non-linear optical, electrical characteristics with respect to temperature. Particularly its optical properties change significantly in the visible and near IR range at its phase transition temperature (TC ~ 68℃). As the temperature exceeds TC, it goes through structural change and becomes less transparent and more reflective, preventing thermal radiation from excessively heating while remaining visually transparent. Therefore, this phenomenon can be applicable to smart window applications. We are developing solution-phase synthetic routes, including hydrothermal processes, to organically functionalized vanadium oxide nanoparticles in order to use them to fabricate nanostructured thin films. These results of structural and spectroscopic characterizations on the formation of vanadium oxide nanostructures as well as the effects of solution compositions, reaction conditions will be discussed in the presentation.