

Phase transition study in strongly correlated VO₂ based sensing systems

A.Simo K.Kaviyarasu B.Mwakikunga R.Madjoe A.Gibaud M.Maaza

ABSTRACT:

Intermediate phase monoclinic M2 was observed by inducing in situ X-ray thermo diffraction on VO₂ (M) nanoplatelets. The solid-solid phase transition occurs at around 65 °C assisted with the percolative transition metal-insulator. The existence of an intermediate crystalline phase with room temperature insulator phase and high temperature metallic phase across MIT in VO₂ could be of relevance to understand structural contributions to the phase transition dynamics. In addition, pellet of VO₂ nanostructures have shown to present good sensing properties to various alcohols vapors at room temperature and good selectivity of methanol with 5.54% sensitivity and limit detection below 5 ppm, compared to isopropanol 3.2% and acetone 2.4% respectively.