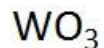


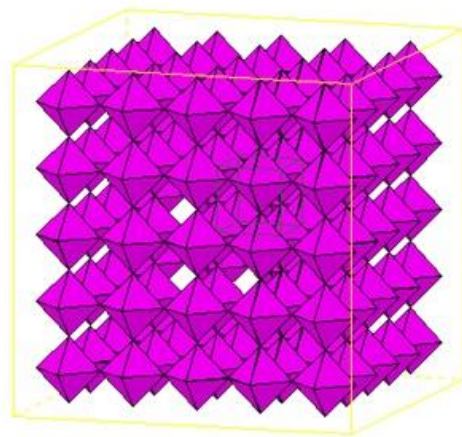
PHASE FIELDS

Nanotechnology offers toolbox of new or metastable phases

- Stable phases

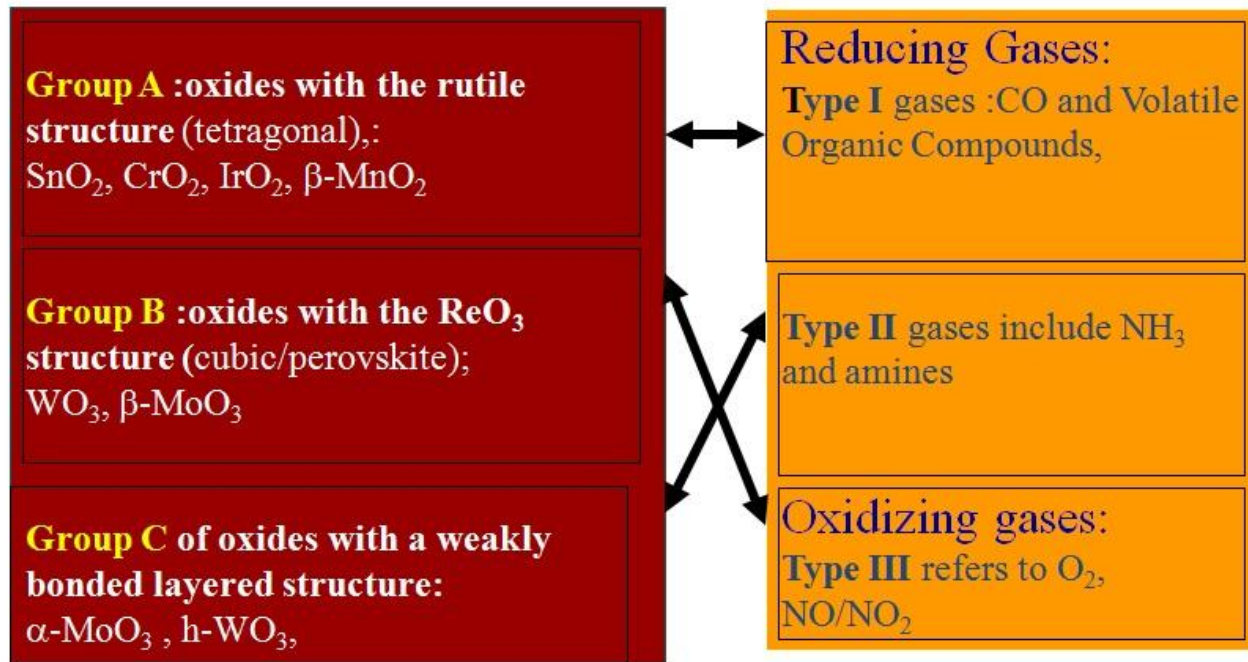


- A distortion of ReO_3 -like structure
- From α phase to δ phase, such distortion occurs between two adjacent $[\text{WO}_6]$ units.



SEMI-EMPIRICAL MAP OF GAS-OXIDE INTERACTIONS

P. I. Gouma, "" , *Rev.Adv. Mater. Sci.*, 5, pp. 123-138, 2003

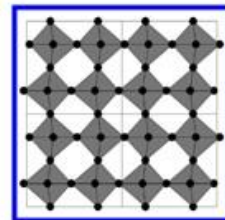
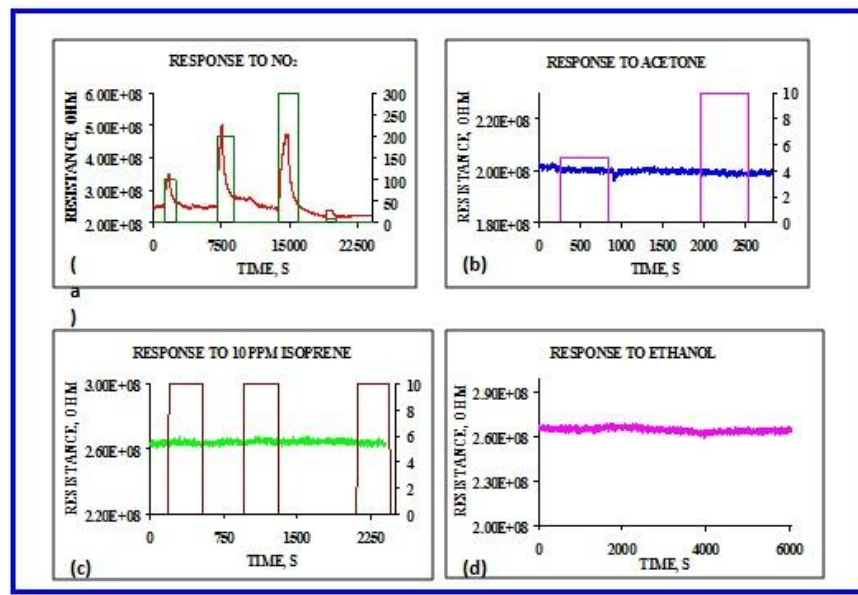


Principle of Specificity for Resistive Chemosensors

SELECTIVE NO SENSOR

P.I Gouma and K. Kalyanasundaram, "A Selective Nanosensing Probe for Nitric Oxide",
Appl. Phys. Lett. 93, 244102, 2008

Monoclinic polymorph of tungsten trioxide is selective towards NO/NO₂ and shows no response to reducing gases such as isoprene, acetone, ethanol, methanol in a 100% N₂ atmosphere



SELECTIVE ACETONE SENSOR

L. Wang, A. Teleki, S.E. Pratsinis, and **P.I. Gouma**,

"Ferroelectric WO_3 Nanoparticles for Acetone Selective Detection", *Chem. Mater.*, 20(15), pp. 4794-4796, 2008.

$\epsilon\text{-WO}_3$

shows net spontaneous polarization ;
ferroelectricity.

Significant difference of physical
properties from other WO_3
polymorphs
(Volume contraction, bandgap
increase)

Cannot stably exist above RT

