

Abstract Submitted
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Gating Effect on VO₂ nanowire by Ionic Liquid¹ HENG JI, JIANG WEI, DOUGLAS NATELSON, Rice University — VO₂ is a well-known strongly correlated material with insulator-to-metal phase transition at 68 °C. Below this temperature, VO₂ is an insulating material whose temperature dependence behaves like a semiconductor with 0.6 eV band gap. However, such material cannot be gated by traditional method. In our experiment, we applied a new technique, using ionic liquids, to provide a much stronger transverse electric field on the VO₂ nanowire. We did not observe obvious gating effect on VO₂, but in the meantime, we found that VO₂ is sensitive to hydrogen. The hydrogen produced by electrochemistry when applying voltage on the electrolyte (an ionic liquid with water contamination, in this case) can dramatically change the conductance of VO₂.

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