

# Hydrogen gas sensor based on material with yttrium nanoparticles

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## Abstract

© 2015 Nova Science Publishers, Inc. The preparation of new types of nanosystems based on metallic yttrium nanoparticles, which are difficult to produce by traditional methods due to the high melting temperature and the extremely high oxidizability of this metal, has been demonstrated. The materials were prepared with an high vacuum cluster beam set-up intended for the formation of metal nanoparticle by laser ablation. Yttrium nanoparticles were synthesized, and their chemical reaction with hydrogen were studied at room temperature. It is shown that the reaction corresponding to the metal-dielectric phase transition is reversible with respect to the hydrogen pressure. Thus, yttrium nanoparticle materials can be effectively used as optical hydrogen gas sensors.

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## Keywords

Hydrogen gas sensor, laser ablation, plasmon resonances, yttrium based nanoparticles, yttrium dihydride