DEPARTAMENTO DE FÍSICA FUNDAMENTAL

A novel system based on MoTe 2(1-x)Se2x alloy and functionalized with EGaIn nanoparticles for hydrogen gas sensing.

Gema Tabares and Nuria Gordillo

Applied Physics Department
Autonomous University of Madrid

nuria.gordillo@uam.es
gema.tabares@uam.es

In the context of climate stabilization, the shift towards decarbonizing energy systems emphasizes green hydrogen as a key alternative for reducing emissions. However, the inherent flammability and lightness of hydrogen present challenges, underscoring the critical need for early leak detection. Transition-metal dichalcogenides, specifically MoTe2(1-x)Se2x, are considered promising for this purpose due to their hydrogen affinity, particularly at the edges of the 2H phase layers. Additionally, gallium and indium nanoparticles (NPs) are of great interest for their tunable plasmon resonance energy. This work explores the potential and limitations of functionalizing Ga and In NPs on MoTe2(1-x)Se2x-based substrates, aiming to assess their viability in optical or electrical gas sensing devices, leveraging their compatibility with hydrogen atoms.

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