

Platinum nanonetwork gated AlGaIn/GaN HEMT based hydrogen sensor

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Hydrogen gas sensing is very important in electric and fuel cell vehicle application for alternative energy conversion as well as many industries. Prompt detection of very small amount of hydrogen can prevent the explosive accidents and environmental pollutions in the area of semiconductor fabrication facilities, petroleum distillation towers and chemical plants. We have demonstrated a highly sensitive AlGaIn/GaN high electron mobility transistor (HEMT) based hydrogen sensor using Pt nanonetworks synthesized by low cost aqueous solution method as gate material. Nanostructure platinum with large reactive surface was applied to active layer of semiconductor sensors and readily improved the sensitivity. The nanonetwork sensor shows rapid response and good repeatability in its current change to repeated introductions of H₂ into the ambient.