

Applications of platinum nano-networks for hydrogen sensing

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Hydrogen has driven great attention as one of the most promising alternative energies. It does not produce any harmful byproducts such as carbon dioxide and nitrogen oxide during the conversion. Despite these significant advantages, due to the possibility of explosion, its commercialization has been delayed. Under this situation, robust and precise hydrogen sensing is essential for wide usage of hydrogen gas.

In this work, we fabricated diverse types of hydrogen sensors which use platinum(Pt) nano-networks as sensing materials. Pt nano-networks were readily synthesized through phase transfer method at room temperature and uniformly applied to desired semiconductor surfaces by spin coating and conventional lift off process. It has larger specific surface area than conventional film type and results in an increase of sensitivity for hydrogen gas detection. For more improvement in hydrogen sensing, AlGa_N/Ga_N heterostructure that has 2 dimensional electron gas at the interface was also used. In conclusion, several types of hydrogen sensors using Pt nano-networks were fabricated and show stable, prompt and sensitive behavior to the exposure to hydrogen.