

## Palladium Nanowire Device using Direct Current Assisted Dielectrophoresis Method for Hydrogen sensor

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Semiconductor and metallic nanowires whose small size and high specific surface area would be expected to improve the sensitivity, response time and power requirements in chemical and biological sensors, are suitable for the fabrication of a variety of devices. Although interesting nanowires can be achieved using these techniques, their use for mass production would suffer from the major drawback. Even though nanowire assembly techniques such as dielectrophoresis(DEP) allow for easy integration with conventional semiconductor technology, there are some challenges which remain to be overcome. In order to address problems, this work has introduced novel electrochemical methods of fabricating a single Pd nanowire based on DC assisted DEP growth process. This process using floating electrode among several methods developed for the first time in this work is one of the best promising methods to create single Pd nanowire with less than 200nm radius. Finally, the single Pd nanowire is capable of detecting hydrogen in the concentration range from 500 to 5000 ppm with high reproducibility, thus demonstrating its suitability for use as a hydrogen sensor.