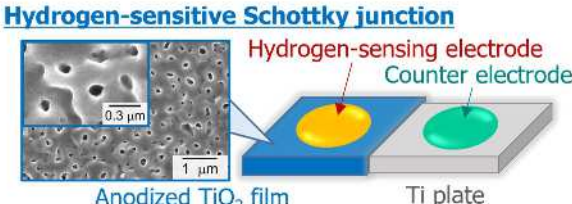
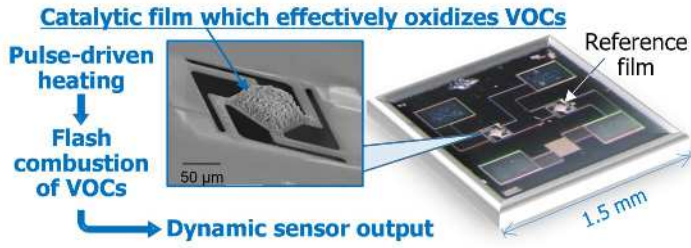
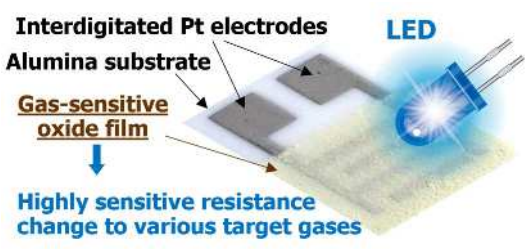


Name HYODO Takeo	Job Title Professor	Area of Expertise: Functional Materials Chemistry, Chemical Sensors
1. Main Research Topics (a) Highly sensitive and selective diode-type hydrogen sensors The barrier height of the Schottky junction, which combines an anodically oxide film (e.g., TiO₂) with a noble metal such as Pd and Pt, is very sensitive to hydrogen under gaseous atmosphere. We have developed high-performance hydrogen sensors by their optimization of the composition and/or microstructure.  (b) Adsorption/combustion-type VOC microsensors based on MEMS platforms Modern microelectromechanical systems (MEMS) technology provides a micro platform for various gas sensors. An adsorption/combustion-type gas sensor with a catalyst film and a reference film, which are formed over Pt heaters, can high-sensitively detect various volatile organic compounds (VOCs, e. g., toluene) by the flash combustion of the VOCs adsorbed on the catalyst surface.  (c) Light-driven semiconductor-type gas sensors operable at room temperature General semiconductor gas sensors operate at elevated temperatures, while the effective light irradiation to the gas sensors by a light-emitting diode (LED) makes them detect some gases even at room temperature. The compositional and microstructural optimization of the oxide film significantly improves the gas-sensing properties.  (d) Others A variety of highly functional materials and devices, such as “oil-quality sensors” and “functional porous microspheres and electrodes” has been developed in our laboratory.		
2. Keywords Chemical sensors, Gas sensors, Oil-quality sensors, functional ceramics, mesoporous and macroporous materials, Electrochemistry, Semiconductor, Solid electrolyte, Hydrogen, Carbon monoxide, VOCs		
3. Remarks and Websites We conduct a number of research projects using funding from the Japan Society for the Promotion of Science (FY2021–FY2023: Grants-in-Aid for Scientific Research B "Highly sensitive and selective sensing technology for biogases based on dynamic adsorption combustion" and FY2024–FY2026: Grants-in-Aid for Scientific Research B "Development of ultrasensitive, highly selective, and rapid-response hydrogen-monitoring devices"), other competitive funds, and joint research grants. Please see the following websites for our various research results. · researchmap: https://researchmap.jp/TH_nagasaki?lang=en · Lab. HP: http://www.cms.nagasaki-u.ac.jp/lab/zaika/ · ORCID: https://orcid.org/0000-0003-1605-5623 · Google Scholar: https://scholar.google.com/citations?user=5yPHuqoAAAAJ&hl=ja · J-Global: https://jglobal.jst.go.jp/en/detail?JGLOBAL_ID=200901017381080194		