Development of High Sensitive Pressure Sensor using Dielectric Thin Films

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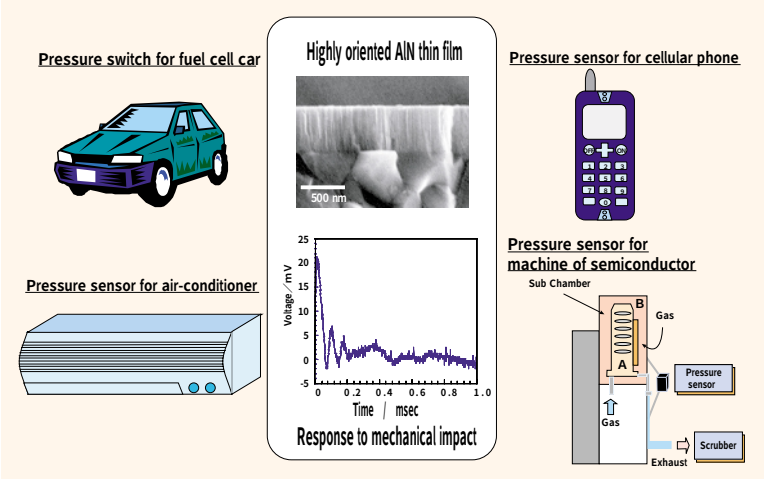
We have developed new high sensitive pressure sensors using dielectric thin films for fuel cells or appliances such as an air-conditioner, utilizing new technology. Especially, we investigated preparation conditions of highly oriented dielectric thin films such as aluminum nitride (AlN), zinc oxide (ZnO) and LiNbO3 by using design of experiments (ANOVA) and theoretical analysis in order to improve the sensitivity and the reliability of the sensors. The new type sensors consist of electrodes and piezoelectric thin films, and their structures are very simple.



Application of new pressure sensors

Oxidation of Propene by Molecular Oxygen over Ti-modified Silicalite Catalysts

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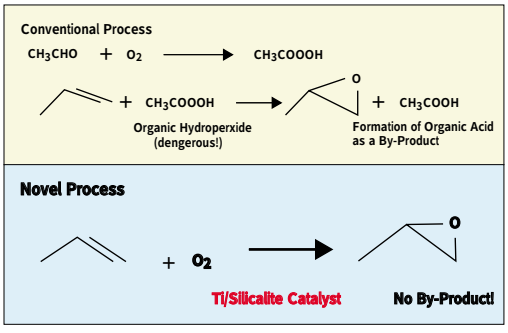
Ti-modified zeolite with a high silica content (Si/Al ratio=1900, HSZ(1900)) was found to catalyze the oxidation of propene by molecular oxygen at 573K to produce oxygenates, in particular, to propene oxide at a conversion of 20% with a selectivity of 26%. The catalytic performances are affected by Si/Al ratio of the HSZ supports as well as the presence of titanium cation or TiO_2. It is expected that fine controls of the cooperation between moderate acid properties of HSZ(1900) and titanium cation or TiO_2 may enhance the catalytic activity and selectivity for propene oxide formation.



Comparison of novel and conventional processes.