

## Novel Measuring Method for Detection of Propene Using Zirconia-Based Amperometric Sensor with Oxide-Based Sensing Electrode

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An amperometric sensor based on yttria-stabilized zirconia (YSZ) and an oxide-based sensing electrode (SE) was examined for the detection of propene. Among the various oxide-based SEs tested, ZnO (+8.5 wt.% Pt) was found to give good sensitivity and selectivity to C<sub>3</sub>H<sub>6</sub> at 600°C. A novel measuring method named “pulsed-potential method” was adopted here to obtain improved sensing characteristics. It was shown that the application of this method to the amperometric sensor resulted in significant enhancement in C<sub>3</sub>H<sub>6</sub> sensitivity. The current response to 400 ppm C<sub>3</sub>H<sub>6</sub> obtained by the “pulsed-potential method” was as high as 95 μA, which is about twenty times higher than that obtained by the conventional “constant-potential method.” It was also found that the C<sub>3</sub>H<sub>6</sub> sensitivity of the sensor was hardly affected by the changes in oxygen and water vapor concentrations in the examined range of 3–20 vol.% and 1–16 vol.%, respectively. Furthermore, the present amperometric sensor exhibited relatively good stability.

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