

Detection of Ammonia Using a Zirconia-Based Potentiometric Sensor with a Tungsten-Oxide Electrode

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The response of a potentiometric exhaust gas sensor to 0-250 ppm NH_3 was investigated in the range 500-650°C and in the presence of up to 9.9% O_2 (balance N_2). The sensor consisted of a tungsten oxide electrode sputter-deposited on an yttria-stabilized zirconia disk, with a Pt reference electrode on the opposite face exposed to air. The response to NH_3 was found to decrease with higher temperatures and O_2 concentrations. At 600°C and in 9.9% O_2 the response to NH_3 was fairly linear (~0.13mV/ppm). The magnitude of the response to NH_3 in 9.9% O_2 was compared to that for NO , NO_2 , and C_3H_6 . For $T \geq 550^\circ\text{C}$, the response to NO_2 and C_3H_6 was only ~20% of that for NH_3 , with little sensitivity to NO observable. The sensitivity to NH_3 at 600°C, however, was found to decrease by more than 30% in the presence of 200 ppm NO_2 .