

## Solid Oxide Amperometric CO Sensor for Monitoring Exhaust Gas from Water Heater

Tatsumi Ishihara\*, Phawachalotorn Armonat<sup>1</sup>,  
Rie Kadowaki and Oravan Sanguanruang<sup>1</sup>

Department of Applied Chemistry, Faculty of Engineering, Kyushu University  
Motooka 744, Nishi-ku, Fukuoka 819-0395, Japan

<sup>1</sup>School of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok, Thailand

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An amperometric CO sensor using a solid oxide electrolyte was studied and it was found that the oxygen pumping current increased with increasing CO concentration when using Au(10 wt%)/In<sub>1.9</sub>Sn<sub>0.1</sub>O<sub>3</sub> and RuO<sub>2</sub>(10 wt%)/La<sub>0.6</sub>Sr<sub>0.4</sub>CoO<sub>3</sub> as the electrode catalysts and La<sub>0.9</sub>Sr<sub>0.1</sub>Ga<sub>0.8</sub>Mg<sub>0.2</sub>O<sub>3</sub> as the electrolyte. Mixed potentials are also observed on this sensor upon exposure to CO, and so changes in oxygen pumping current may be caused by the mixed potentials formed upon exposure to CO. Substitution of Ga in the LaGaO<sub>3</sub> electrolyte with Fe is effective for increasing the sensitivity, and this sensor is almost insensitive to CO<sub>2</sub> and CH<sub>4</sub>. As a result, it is expected that this sensor can be used for the detection of CO in exhaust gas from a small gas water heater without a flue line.

\*Corresponding author: e-mail: ishihara@cstf.kyushu-u.ac.jp