

## Abstract

AC electrical conductivity of CeO<sub>2</sub> catalyst samples containing 5, 10 and 20 wt% SnO<sub>2</sub> prepared by co-precipitation and of SnO<sub>2</sub> and CeO<sub>2</sub> pure oxides (prepared under the same conditions) was measured in *operando* conditions. The measurements were carried out at a frequency of 1592 Hz in the temperature range from room temperature up to 400 °C, using successively programmed heating–cooling cycles under various atmospheres. The catalyst samples were tested in the catalytic oxidation of CO in presence and in absence of oxygen in the same temperature range (30–400 °C). An improved deep oxidation of carbon monoxide has been found with these co-precipitated mixed oxides compared to pure components, leading to a better catalytic activity at lower temperature. The band gap energies were estimated based on the UV–Vis spectra and correlated with XRD results and AC electrical conductivity data. These results show the influence of the tin oxide on the electrical properties and oxygen mobility of the catalytic systems studied and on the surface behaviour of ceria.

Keywords: Tin–cerium mixed oxides catalysts; Electrical conductivity; Surface dynamics; CO oxidation