

Supporting information to:

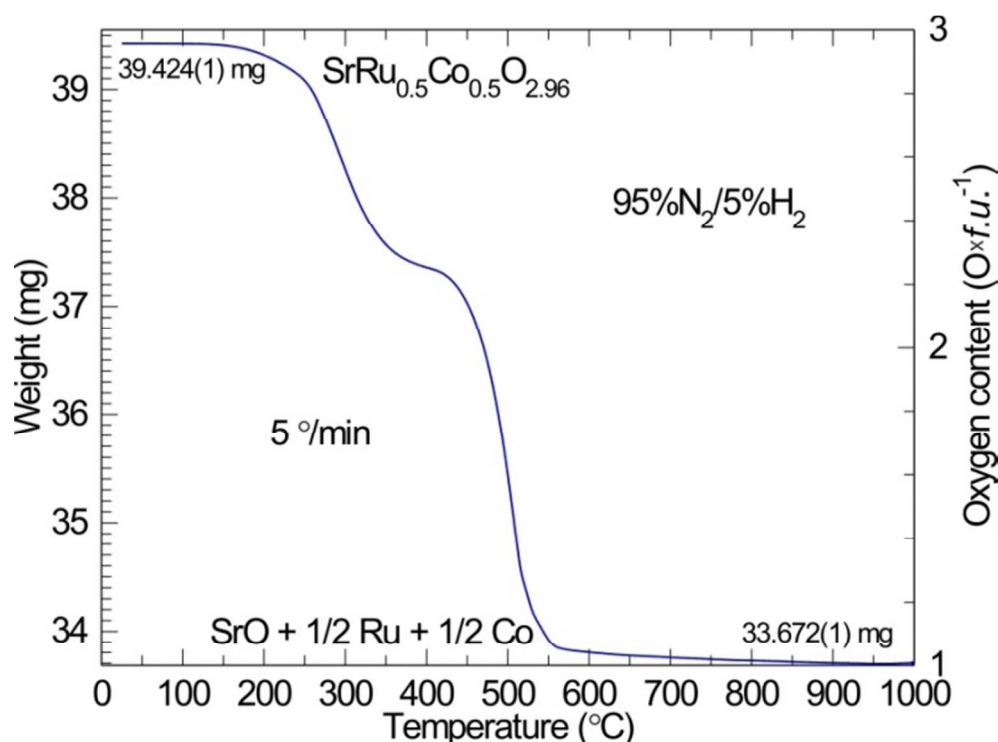
"A complete high-to-low spin state transition of trivalent cobalt ion in octahedral symmetry in $\text{SrCo}_{0.5}\text{Ru}_{0.5}\text{O}_{3-\delta}$ "

Authors:

Jin-Ming Chen, Yi-Ying Chin, Martin Valldor, Zhiwei Hu, Jenn-Min Lee, Shu-Chih Haw, Nozomu Hiraoka, Hirofumi Ishii, Chin-Wen Pao, Ku-Ding Tsuei, Jyh-Fu Lee, Hong-Ji Lin, Ling-Yun Jang, Arata Tanaka, Chien-Te Chen, and Liu Hao Tjeng

Thermogravimetry

To investigate the oxygen content of the oxidized samples, they were placed in Al_2O_3 -crucibles and heated to 1000°C in an atmosphere consisting of 95% N_2 and 5% H_2 (50 ml/min). The reduction was done inside a TGA/SDTA 851[°] (Mettler-Toledo) and the gravimetric data was evaluated with the standard STAR[°] software. From the data the calculated composition is $\text{SrCo}_{0.5}\text{Ru}_{0.5}\text{O}_{2.96}$ for the powder treated under 9.5 bars oxygen. This can be compared with $\text{SrCo}_{0.5}\text{Ru}_{0.5}\text{O}_{2.92}$ (one bar oxygen, data not shown).



X-ray diffraction

The powder was investigated by means of X-ray diffraction in a STOE D5000 diffractometer in reflection (Bragg-Brentano) mode. Cu $K\alpha_{1,2}$ radiation was used and a position sensitive detector was employed. A Rietveld analysis of the data was accomplished with Fullprof2000 using the structural model from Kim *et al.* [25] with convincing agreement with those previously reported structural data. The Rietveld fit to the observed data and the acceptable R -values are shown below.

