

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Raman scattering study of mixed metal oxide $\text{Ir}_x\text{Ru}_{1-x}\text{O}_2$ nanowires grown by chemical vapor deposition HAE-YOUNG SHIN, Department of Physics, Ewha Womans University, Seoul, 120-750, Korea, YUMIN LEE, SUNG HEE CHUN, JAEYEON LEE, MYUNG HWA KIM, Department of Chemistry and Nano Sciences, Ewha Womans University, Seoul, 120-750, Korea, SEOKHYUN YOON, Department of Physics and Department of Chemistry and Nano Sciences, Ewha Womans University, Seoul, 120-750, Korea — We present Raman scattering results of mixed metal oxide $\text{Ir}_x\text{Ru}_{1-x}\text{O}_2$ nanowires that have been studied for their stability and for activity as electrocatalysts. For our study, 1-dimensional metallic mixed oxide single crystalline $\text{Ir}_x\text{Ru}_{1-x}\text{O}_2$ nanowires were synthesized, for the first time, via a simple physical vapor transport process by controlling relative ratios of two precursors, RuO_2 and IrO_2 , respectively. We measured Raman spectra of $\text{Ir}_x\text{Ru}_{1-x}\text{O}_2$ nanowires using excitation laser sources with wavelengths of 488 nm and 632.8 nm. We observed that an E_g phonon mode of an $\text{Ir}_x\text{Ru}_{1-x}\text{O}_2$ nanowire is being blue-shifted linearly with respect to the Ir contents. We could use our observation of frequency shift of the E_g phonon to determine stoichiometry information of nanowires which we also measured and confirmed by using EDS. From the shape of the phonon modes we measured, we could get information regarding crystalline quality that was also measured by HRTEM. We show that Raman scattering spectroscopy can provide a simple, prompt, and effective mean to measure the stoichiometry and crystalline quality of mixed metal oxide nanowires.

Seokhyun Yoon
Ewha W. University, Seoul, Korea

Date submitted: 10 Nov 2011

Electronic form version 1.4