ZrTiO$_4$ nanowire growth using membrane-assisted Pechini route

P. R. de Lucena*$^{a,d}$, W. A. Prado$^b$, V. S. Braga$^a$, N. L. V. Carreño$^c$

$^a$Universidade Federal do Oeste da Bahia, $^b$Universidade Federal do Rio Grande do Sul, $^c$Universidade Federal de Pelotas.

Universidade Federal do Oeste da Bahia, Centro de Ciências Exatas e das Tecnologias, Campus Reitor Edgard Santos, Estrada do Barroçao, Barreiras, Bahia

The high surface-to-volume ratio of nanowires makes them natural competitors as new device components. In this regard, a current major challenge is to produce quasi-one-dimensional nanostructures composed of well established oxide-based materials. This article reports the synthesis of ZrTiO$_4$ nanowires on a silicon (100) wafer in a single-step deposition/thermal treatment. The template-directed membrane synthesis strategy was associated with the Pechini route and spin-coating deposition technique. ZrTiO$_4$ nanowires were obtained at 700 ºC with diameters in the range of 80-100 nm. FEG- SEM images were obtained to investigate ZrTiO$_4$ nanowire formation on the silicon surface and energy dispersive x-ray detection (EDS) and x-ray diffraction (XRD) analyses were performed to confirm the oxide composition and structure.