



Contribution ID: 724

Type: **Poster Presentation**

## M2Po2B-03 [34]: Chemical solution deposition of Y1Ba2Cu3O7-x thin films on SrTiO3 substrates

*Tuesday, 23 July 2019 13:30 (2 hours)*

Conventionally the fabrication of superconducting thin films is carried out by tedious processes and requires expensive equipment. Here we report the growth of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> (YBCO) thin films on SrTiO<sub>3</sub> substrates by the low-cost chemical solution deposition technique [1]. The preparation includes the precipitation of yttrium, barium and copper acetates in oxalic acid; and directly dripping onto SrTiO<sub>3</sub> ([100] orientation) substrates. The epitaxial growth of the deposited layer was carried out by calcination and thermal treatments at 840 and 860 °C. The surface morphology was inspected by optical microscopy. X-ray diffraction (XRD) confirms the preferential epitaxial growth (001) of the YBCO crystallites, especially after thermal treatment at 860 °C. Both samples show a superconducting critical temperature of 90 K. The estimation of the critical current density (J<sub>C</sub>) of the samples was measured indirectly from their respective hysteresis cycles following the Bean equation [2] at 10 K. For the sample treated at 840 °C, J<sub>C</sub> was 19 x 10<sup>4</sup> A/cm<sup>2</sup>, while for the sample obtained at 860 °C J<sub>C</sub> was 17 x 10<sup>9</sup> A/cm<sup>2</sup>, indicating that a thermal treating of 840 °C is enough to obtain a versatile YBCO thin film.

[1] Yuanqing Chen et al. (2016). High Critical Current Density of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Superconducting Films Prepared through a DUVassisted Solution Deposition Process. Scientific Reports. DOI: 10.1038/srep38257.

[2] J. Narayan, A. Bhaumik y R. Sachan., Journal of Applied Physics Vol 123 2018 135304.

**Primary author:** Mr GARCIA DULANTO, Jorge Luis (Laboratorio de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas)

**Co-authors:** Dr BUSTAMANTE DOMINGUEZ, Angel (Laboratorio de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas); Dr DE LOS SANTOS VALLADARES, Luis (Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education) Northeastern University); Dr BARNES, Crispin (Cavendish Laboratory, Department of Physics, University of Cambridge); Mr FLORES SANTIBANEZ, Jesus (Laboratorio de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas); Mr SANCHEZ CORNEJO, Henry Elias (Laboratorio de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas)

**Presenter:** Mr GARCIA DULANTO, Jorge Luis (Laboratorio de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas)

**Session Classification:** M2Po2B - REBCO, Coated Conductor Processing