

# Epitaxial Growth of Y-stabilized ZrO<sub>2</sub> Buffer Layers for YBCO Coated Conductor by MOCVD

Jong-Won Sun<sup>a,b</sup>, Hyoung Seop Kim<sup>b</sup>, Tae-Won Joung<sup>a,c</sup>, Soon-Dong Park<sup>a</sup>,  
Choong-Hwan Jung<sup>a</sup>, Byung-Hyuk Jun<sup>a</sup>, Chan-Joong Kim<sup>a</sup>

<sup>a</sup>*Nuclear Materials Development Team, Korea Atomic Energy Research Institute, Daejeon, Korea*

<sup>b</sup>*Department of Metallurgical Engineering, Chungnam National University, Daejeon, Korea*

<sup>c</sup>*Department of Material Science and Engineering, Kumoh National Institute of Technology, Gumi, Korea*

Y-stabilized ZrO<sub>2</sub>(YSZ) buffer layers for YBCO coated conductors were deposited on MgO the single crystal and bi-axially textured NiO/Ni and CeO<sub>2</sub>/Ni substrates by metal organic chemical vapor deposition, using Y(thd)<sub>3</sub> and Zr(thd)<sub>4</sub>. To establish the deposition condition of YSZ, deposition temperature and oxygen flow rate were changed at constant working pressure of 10 Torr. The texture and the surface roughness were estimated by X-ray pole figure and atomic force microscopy. When YSZ was deposited on MgO single crystal, (200)texture was developed at 660°C~800°C at oxygen flow rate of 100~500 sccm. When using CeO<sub>2</sub>/Ni substrate, (200) texture was obtained at deposition temperature of 740°C at oxygen flow rate of 300 sccm. The surface roughness increased with increasing deposition temperature. And the FWHMs of in-plane and out-of-plane of the YSZ films on the single crystal MgO were fairly good as 1° and 5°, respectively.

keywords : MOCVD, YSZ, NiO/Ni & CeO<sub>2</sub>/Ni substrate, coated conductors

Acknowledgement : This research was supported by a grant from Center for Applied Superconductivity Technology of the 21st Century Frontier R&D Program funded by the Ministry of Science and Technology, Republic of Korea.