

## Micro-Raman spectroscopy analysis of MOD-TFA YBCO films growth process\*

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We describe the high potentiality of micro-Raman spectroscopy for non-destructive characterization of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (YBCO) coated conductors with high current densities, grown by the Metal-Organic Decomposition using metal trifluoroacetates (MOD-TFA) [1]. Micro-Raman is envisaged as a very sensitive technique to detect secondary and impurity phases. Particularly, it has enabled us to study the reaction transformation from the pyrolyzed MOD precursors to the YBCO phase formation through the analysis of quenched samples. The distinct Raman scattering selection rules for the optical phonons of YBCO has enabled us to determine the c/a-axis grain fraction of the films. A strong correlation was observed among the c-axis grains contents and variations of grow parameters like temperature,  $P(\text{H}_2\text{O})$  and total gas flow. Those parameters influence the removal of HF and thus the reaction of  $\text{BaF}_2$  decomposition to obtain YBCO films with excellent superconducting properties. Furthermore, micro-Raman analysis performed to TFA films grown at low temperatures lead us to propose an existing relationship among: a-axis grains, porosity and superconducting properties.

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[1] O. Castaño et al. Supercond. Sci. Tech. 16 (2003) 45 - 53.