

Comparison of the Reaction Nature of $\text{YBa}_2\text{Cu}_3\text{O}_x$ Synthesized from 99.9% BaCO_3 and 99.7% BaCO_3

Jong-back Moon³, Jung-Suk Choi¹, Byung-Hyuk Jun¹, Ho-Young Lee²,
Sang-Heon Lee³, Chan-Joong Kim¹

¹*Nuclear Nano-material Development Laboratory, Korea Atomic Energy Research Institute*

²*Ceracom Co*

³*Department of Electronic engineering, Sunmoon University*

$\text{YBa}_2\text{Cu}_3\text{O}_x$ is synthesized by the conventional solid state reaction method using powders. The price of $\text{YBa}_2\text{Cu}_3\text{O}_x$ is decided by the price of the used raw material powders and the processing technique. To commercialize the $\text{YBa}_2\text{Cu}_3\text{O}_x$ powder, it is necessary to reduce the price. It is expected that the price can be reduced by using cheap raw material powders. The price of low purity BaCO_3 is much cheaper than high purity BaCO_3 . In this study, we selected two different BaCO_3 powders of 99.9% (High Purity Chemicals, Japan) and 99.7% (China Product) and then synthesized $\text{YBa}_2\text{Cu}_3\text{O}_x$ powders by the solid state reaction. We mixed of the powders with Y_2O_3 and CuO powders of a purity of 99.9% and calcined the powder mixture at 800°C -900°C in air. We compared the reaction nature of $\text{YBa}_2\text{Cu}_3\text{O}_x$ when using two different BaCO_3 powders. The phase formation was investigated by X-ray diffraction method and SEM microscopy. The superconducting properties (T_c and J_c) were measured by means of four probe technique and SQUID magnetometer.

Keyword : $\text{YBa}_2\text{Cu}_3\text{O}_x$ superconductor, raw material powders, BaCO_3 , superconducting properties(T_c , J_c)