

Superconductivity of REBa₂Cu₃O_{7-δ} (RE= Y, Dy, Er) Ceramic Synthesized Via Coprecipitation Method

ABSTRACT

The REBa₂Cu₃O_{7-δ} (RE= Y, Dy, Er) superconducting ceramics have been prepared via coprecipitation(COP) method from nearly saturated solutions of metal acetates and 2-propanol solution of oxalic acid. The metal oxalates powders were subjected to thermal treatment of 12 hours calcination at 900oC. The pelletized powder was sintered for 15 hr at 920oC. All samples showed a single step transition in the R-T curves. The TC(R=0) for samples Dy123, Y123and Er123 and were 93 K, 91 K and 90 K, respectively. XRD data showed single phase of an orthorhombic structure for all samples. SEM micrographs showed large grain sizes that are randomly distributed. These results showed that COP method using metal oxalates starting powders is very effective to synthesize high quality superconductors and shorten the sintering time required due to the formation of sub micron oxalate powders.

Keyword: Superconductivity, mechanical & thermal, ceramic