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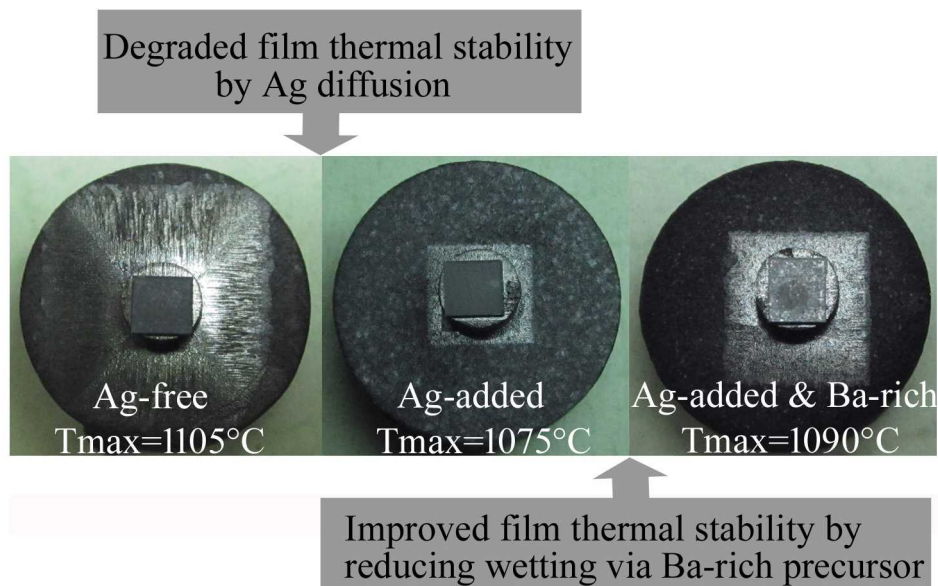
Study on the thermal stability of the NdBCO film in inducing the growth of REBa₂Cu₃O_x/Ag superconductor bulks

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The NdBCO-film is a prominent seed in melt-growth of REBa₂Cu₃O_x (REBCO, RE=rear earth element) cryomagnets because of its extremely high thermal stability, which, however evidently degraded, when Ag was added into NdBCO for improving its brittle nature, leading to fabrication failure. Here we clarified that film thermal stability is caused by high wettability of the Ag-added liquid, governed by precursor composition of REBCO/Ag. We developed a novel film seed/buffer-pellet/main-pellet construction to effectively strengthen film thermal stability via wetting modification by exploiting Ba-rich buffer-pellets, and succeeded in growing high superconductivity NdBCO/Ag bulks. This new conception is broadly applicable for producing all REBCO/Ag cryomagnets.



Graphical Abstract: The top view of three kinds of NdBCO grown samples with procedures at their correspondingly tolerable maximum temperature(T_{max}).

Keywords: superconductor, thin film, wetting, thermal stability