Fabrication and Characterization of Nickel Oxide Films on Textured Nickel Substrate for Superconductor Buffer Layer

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Recently, NiO films have been studied as a buffer layer to fabricate the superconductor with preferred orientation and as a diffusion barrier to prevent the reaction between superconductor and textured nickel substrate. We fabricated NiO films on textured Ni substrate by thermal oxidation at different temperature, oxidation time, atmosphere, and cooling rate. We investigated the alignment of NiO films by XRD and pole figure and the microstructures by SEM. (200) <001> alignment of NiO film was observed at the oxidation condition of 1200℃ for 10min and slow cooling in O2 atmosphere. During the process in Ar atmosphere, we could also observe the thermal faceting which affects the alignment of NiO films on Ni substrate.