Fabrication of Cube Textured Au/Ni Template using Electoless-plating

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We fabricated the Au/Ni template for YBCO coated conductors and evaluated texture formation and the microstructural evolution. The cube textured Ni substrate was fabricated by rolling and recrystallization annealing, and Au layer formed on the substrate by electroless-plating method. The texture was measured by pole-figure with x-ray goniometer and evaluated by orientation distribution function (ODF) analysis. The surface roughness and grain boundary morphology of template were characterized by atomic force microscopy (AFM)

Texture analysis indicated that Au layer deposited epitaxially on the Ni substrate and formed a strong cube texture when processing variables such as plating time and soft etching time were optimized. The full-width at half-maximum (FWHM) was 8.4° of out-of-plane and 9.98° of in-plane texture. In addition, the thickness of Au layer was increased monotonically as increasing the processing time. The texture evolution, surface roughness, and grain boundary morphology of the template will be presented in detail.

keywords : electoless-plating, pole-figure, texture, YBCO coated conductor

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