

Ni-S and Ni-W Alloy Tape as Substrates for YBCO Coated Conductors

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Ni-S and Ni-W alloys as substrates for YBCO coated conductors were fabricated by powder metallurgy process. Content of Sulfur and Tungsten were 0.1 at.% and 0.05 at.% and 1 at.%, 3 at.% and 5 at.%, respectively. The alloy powders were mixed with Ni powder with an average size of 5 microns, isotatically pressed into Ni rods and then sintered at 1100°C for 6 h in 4%H₂-96%Ar atmosphere for densification. The Ni alloy rods were cold-rolled into thin tapes. During cold rolling, the Ni-S rods were fractured due to the grain boundary embrittlement, but the Ni-W rods were easily deformed into tapes with a thickness of 80 microns without any intermediate annealing. The Ni-W alloy tapes showed the good mechanical properties and better cube texture than pure Ni tapes.

Key words: Ni-S, Ni-W alloy, cube texture, powder metallurgy, coated conductors

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