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Nb3Sn Formation Using Electroplating Method for SRF Cavity

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A novel electroplating method to form Nb3Sn film onto an Nb substrate has been developed and optimized at Fermilab. In this method, a Cu interlayer is plated between an Sn layer and the Nb substrate, then a bronze layer formed in the first step of sequential thermal treatment. Subsequently, the Nb3Sn layer is formed at 700C by a solid diffusion reaction between the bronze layer and the Nb substrate. In order to advance the research on this method, KEK has started the electroplating for Nb3Sn formation with the same method but different plating solutions under the US-Japan cooperation. The thermal treatment and characterization of Nb3Sn samples are performed in the cooperation of NIMS and Tohoku University. Besides, at KEK, remove the excess bronze layer after heat treatment is tried out using several chemical solutions. In this presentation, the result of the Nb3Sn formation by the electroplating method and the progress on surface treatments to remove the bronze layer are reported.

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