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Structural-Microstructural Characteristics and its Correlations with the Superconducting Properties of in-situ PIT Processed MgB₂ Tapes with Ethyltoluene and SiC Powder added ANJANA ASTHANA, Superconducting Materials Center, National Institute for Materials Science, 1-2-1, Sengen, Tsukuba, Ibaraki, H. YAMADA, N. UCHIYAMA, Central Japan Railways Company, Ooyama, Japan, A. MATSUMOTO, H. KITAGUCHI, Y. MATSUI, H. KUMAKURA, Superconducting Materials Center, National Institute for Materials Science, 1-2-1, Sengen, Tsukuba, Ibaraki — The structure and microstructures of pure MgB₂, ethyltoluene and ethyltoluene + SiC added MgB₂ tapes have been investigated by using selected area electron diffraction, bright field, dark field and high resolution electron microscopy. As reported, the J_c values of the ethyltoluene and ethyltoluene + SiC added MgB₂ tapes are much higher than the pure MgB₂ tape sample. Analysis of the microstructures shows that pure MgB₂ tape sample consist of grains of 100-200nm. With the addition of ethyltoluene and ethyltoluene + SiC to the starting powder of *in situ* processed MgB₂ tapes, the grain size decreases drastically to an average size of about 20-50nm. The higher J_c value of the ethyltoluene and ethyltoluene + SiC added MgB₂ tapes as compared to the pure MgB₂ tapes has been attributed to the decrease in grain size and better connectivity of the grains and also presence of pinning centers as some precipitates and Mg₂Si particles of size less than 100nm.

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