MgB2 superconducting bulks with AlB2 doping

Lucas B S da Silva, Durval Rodrigues Jr

Corresponding Author: Lucas Barboza Sarno da Silva, lucasarno@usp.br, Escola de Engenharia de

Optimization in the intrinsic and extrinsic properties of MgB2 superconducting material is extremely important for practical application in cables, wires and tapes. Actually, the mechanisms used for it optimization is through the synthesis process as well as the improvement in the grain connectivity, densification, pinning, doping, and MgO control. Many groups around the word use elements as Ti, Zr, Hf, Al, Mn, Li, Si and others, as a dopant. Defects or any other inhomogeneity in superconducting matrix can improve the flux pinning behavior and, as a consequence, the transport properties. In this work MgB2 superconducting bulks with addition of AlB2 powders was prepared and analyzed, with an attempt to dope the material with Al and simultaneously introduction artificial pinning centers. Superconducting, microstructural and optical characterization were performed and the results were analyzed together. As a result the superconducting critical parameters could be improved, compared with samples of pure MgB2 prepared using the same routes.