Laser processing of thermoelectric oxides

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Ceramic oxides are very promising materials for thermoelectric devices, as they exhibit high Seebeck coe cient and could present relatively low electrical resistivity, as well as high chemical stability at high temperatures. Several oxides exhibi anisotropic thermoelectric properties linked to their layered structures. erefore, texturing methods developing a preferential grain orientation, like the directional growth from the melt, are suitable to enhance the relevant physical properties. ese methods have already shown their applicability to this kind of compounds and also in high Tc superconductor materials, namely, through the use of laser oating zone (LFZ) technique. e LFZ process has demonstrated its suitability for the Co-oxide based thermoelectric materials, processed in the last years in our laboratories. In this work, some examples of th versatility and usefulness of the LFZ technique are shown. e LFZ technique allows obtaining very dense, homogeneous and well textured thermoelectric composites. e results put in evidence an improvement due to electrically assisted laser oating zone on the thermoelectric performances when compared with materials processed by LFZ and by conventional techniques.

Recent Publications

1. A V Kovalevsky, A Myriam, S Populoh, S Patrício, N M Ferreira, S Mikhalev, D Fagg, A Weidenka and J R Frade (2016) Designing strontium titanate-based thermo electrics: An insight into defect chemistry mechanisms. Journal of Materials Chemistry A 5:3909-3922.
2. A Sotelo, F M Costa, N M Ferreira, A Kovalevsky, M C Ferro, V S -6 (h)E.4nKohE.4nKoos7ser ya Fm(r)13 (eira, s F