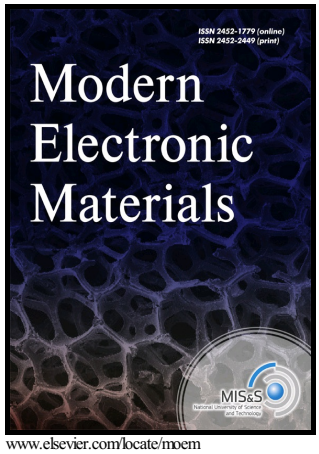

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Influence of plastic formation parameters on structural characteristics of thermoelectric material during hot extrusion

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Abstract. We used mathematical modeling to compare the stress and deformation in a $Bi_{0.4}Sb_{1.6}Te_3$ solid solution base thermoelectric material for extrusion through different diameter dies. The results show that extrusion through a 20 mm diameter die produces a more inhomogeneous deformation compared with extrusion through a 30 mm diameter die. Extrusion through a die of a larger diameter produces a structure that is coarser but has a more homogeneous grain size distribution. The degree of preferential grain orientation is higher for extrusion through a larger diameter die. We found a change in the lattice parameter of the solid