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Temperature Evolution of Pinning Force in GdBaCuO Coated Conductors with Artificial Pinning Centers

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In this report we present results of analysis of pinning force as well as pinning energy in PLD $GdBa_2Cu_3O_{7-x}$ coated conductors doped by $BaSnO_3$ and $BaZrO_3$. Concentrations of both additions in the studied samples have varied from 0 to 18 mole per cent. For all samples we measured magnetization curves in the range of temperature 4,2-77 K and magnetic field up to 14 T. Dependencies of critical current on applied magnetic field $j_c(H)$ were obtained from magnetization curves based on Bean model. Analysis of pinning force was carried out based on the Dew-Hughes approach $F_p/F_{p-max} = b^p(1-b)^q (b = B/B_{irr})$ by used Kramer's plot $J_c^{0.5}B^{0.25}$ for determination of irreversibility field B_{irr}. We found that the normalized pinning force tends to change both functional dependency and peak position as the temperature varies. This result indicates the change of pinning mechanism with decreasing temperature.

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