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Theory and technology of barothermal self-propagating high-temperature synthesis based on damage accumulation modeling

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Theory and Technology of Forming Process

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A compaction process using self-propagating high-temperature synthesis (SHS) has been developed. The process includes preparation of a composite powder billet in conditions that promote uniform pore distribution over the synthesized product, followed by barothermal SHS and compaction of the billet by plastic deformation. To determine the ultimate strain of the synthesized billet, a hereditary damage accumulation model is proposed to

consider two competing processes during compaction: accumulation of microdamage induced by plastic deformation and partial healing of the accumulated microdamage through structural changes. Areas of theoretical studies to intensify the compaction process are identified.

Keywords

self-propagating high-temperature synthesis   powder billet damage accumulation   hereditary model   limit state criterion

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