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Three-dimensional constitutive model for shock-induced phase transition with N transforming phases[1] ZHIPING TANG, YANGBO GUO, Univ. of Sci. and Tech. of China — Phase transitions are commonly controlled by pressure, shear and temperature. In this paper we established 3D incremental constitutive equations for both "stress-induced" and "strain-induced" phase transitions with N transforming phases based on the Gibbs free energy of each phase, which can describe the dynamic deformation behavior of mixed phase. An evolution equation was established considering the over driving force and the growing space in the transition process. The critical criteria, the constitutive equation of mixed phase and the evolution equation constitute the whole constitutive model. The α-ε transition simulation of iron with the present model coincides qualitatively with the experimental result.

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