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Molecular Dynamics Simulation of Sintering of Nanopowders
AMITAVA MOITRA, SUNGHO KIM, SEONG-GON KIM, Mississippi State University — Nanopowder metallurgy is an emerging technology that fabricates sophisticated metal parts by sintering of nano-scale metal powders. Consolidated nanopowders are known to have enhanced mechanical properties compared to conventional micron-size powders. Nanopowders also offer the promise of improving the sintering process since, due to their higher surface area to volume ratio, they can be densified more fully and much quicker resulting lower sintering temperature and higher fracture toughness. To understand the fundamental mechnisms of sintering of nanopowders, molecular dynamics simulations of tungsten nano-particles were performed using the Modified Embedded Atom Method (MEAM). The effects of various heating cycles on sintering process as a function of size of the nanopowders will be presented.

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