

Abstract Submitted
for the TS4CF08 Meeting of
The American Physical Society

Jump frequencies of Cd tracer atoms in $L1_2$ lanthanide stannides¹

MEGAN LOCKWOOD, New Mexico State University, GARY S. COLLINS, Washington State University — Diffusional jump frequencies of Cd tracer atoms were measured as functions of temperature in four lanthanide stannides, Sn_3Pr , Sn_3Nd , Sn_3Sm , and Sn_3Gd , using perturbed angular correlation of gamma rays (PAC). Jumps of tracer atoms on the Sn sublattice lead to fluctuating electric field gradients (EFG) that cause damping of the PAC quadrupole perturbation function. Large jump frequencies were observed as in previous studies on Sn_3La and Sn_3Ce and on lanthanide indides and gallides. Between 800-1100 K, jump frequencies in all stannides were in the range 1-30 MHz. Jump frequencies were thermally activated with fitted activation enthalpies in the range 0.73-1.46 eV and jump-frequency prefactors in the range ~ 0.1 -50 THz. For some alloys, measurements were made both for Sn-rich and Sn-poor samples. It was found that the jump frequencies in Sn_3Sm and Sn_3Gd were greater at the Sn-poor boundary compositions, as previously found also for Sn_3La and Sn_3Ce . Detailed trends will be discussed.

¹Supported in part by NSF grant DMR 05-04843 and an NSF REU summer school at Washington State University.

Megan Lockwood
New Mexico State University

Date submitted: 12 Sep 2008

Electronic form version 1.4