Structure, Heat Capacity and High Temperature Thermal Properties of $Yb_{14}Mn_{1-x}Al_xSb_{11}$

Catherine A. Cox,[1] Eric S. Toberer,[3] Andrey A. Levchenko,[2] Shawna R. Brown,[1] G. Jeffrey Snyder,[3] Alexandra Navrotsky,[2] and Susan M. Kauzlarich[1*]

smkauzlarich@ucdavis.edu

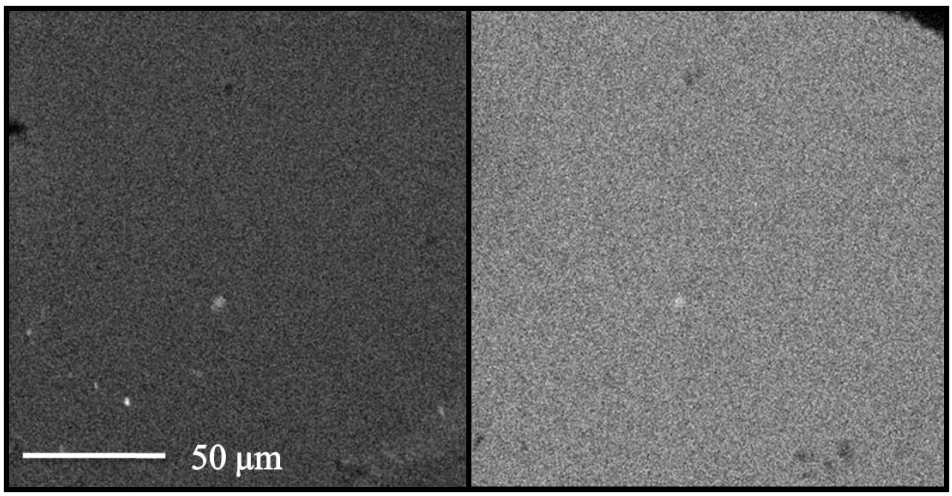
[1]*Department of Chemistry, University of California, One Shields Ave., Davis, CA 95616*

[2]*Peter A. Rock Thermochemistry Laboratory and NEAT ORU, University of California, One Shields Avenue, Davis, California 95616*

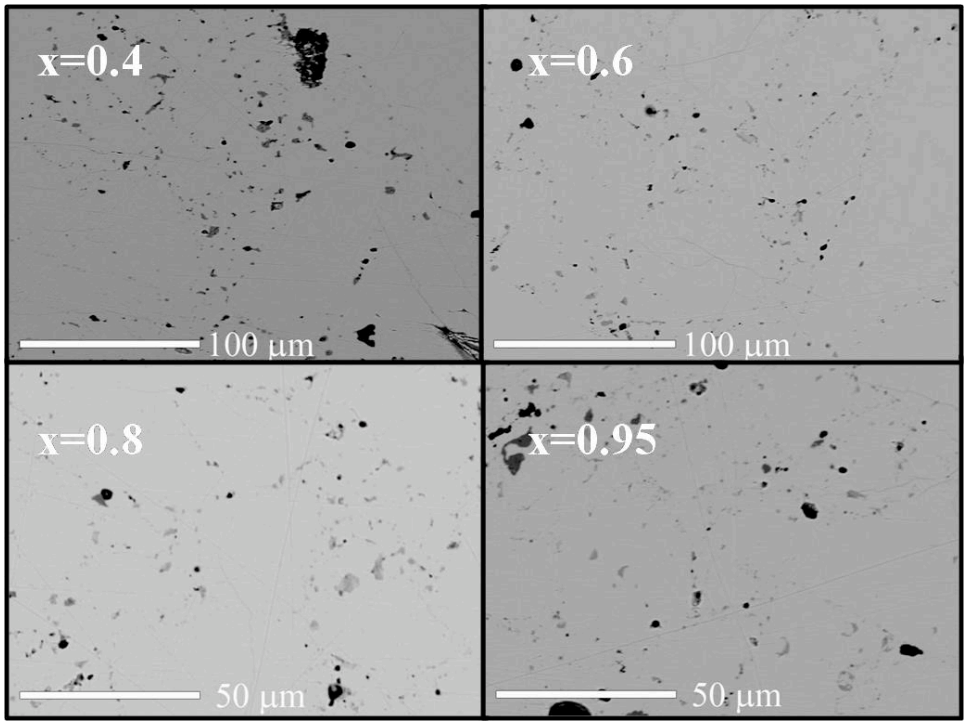
[3]*California Institute of Technology, 1200 California Blvd., Pasadena, CA 91125*

Supporting Information.

Element maps were taken for the x = 0.6 single crystal sample, and are shown in SFigure 1. These maps show that the distribution of Al and Mn across the crystal is homogeneous. The random light and dark specks on the images are surface imperfections or dust since the crystal was measured as-is, not polished or sanded. SFigure 2 shows the microprobe back scattered electron (BSE) images from the pressed pellets: the light-grey regions are identified as the $Yb_{14}Mn_{1-x}Al_xSb_{11}$ phase. There are a few minor small medium-grey regions that were identified as Sn inclusions and a very few dark regions which are voids or Yb inclusions.



SFigure 1. Element maps of the Mn content (left) and Al content (right) for the x = 0.6 single crystal sample showing that the elements are uniform throughout the crystal, consistent with a solid solution.



SFigure 2. Back-scattered electron images of the pressed pellets from electron microprobe analysis. In each image, the majority light grey region is the $Yb_{14}Mn_{1-x}Al_xSb_{11}$ phase, the small areas of slightly darker grey are Sn inclusions, and the black spots are Yb inclusions or physical voids.