

Element Effects on High-Entropy Alloy Vacancy and Heterogeneous Lattice Distortion Subjected to Quasi-equilibrium Heating

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We applied neutron diffraction and positron measurements to estimate the vacancy of CoCrFeNi and CoCrFeMnNi high-entropy alloys (HEAs) using Cu as a benchmark. The corresponding formation enthalpies and associated entropies of the HEAs and Cu were calculated. The vacancy-dependent effective free volumes in both CoCrFeNi and CoCrFeMnNi alloys are greater than those in Cu, implying the easier formation of vacancies by lattice structure relaxation of HEAs at elevated temperatures. Spatially resolved synchrotron X-ray measurements revealed different characteristics of CoCrFeNi and CoCrFeMnNi HEAs subjected to quasi-equilibrium conditions at high temperatures. Element-dependent behavior revealed by X-ray fluorescence (XRF) mapping indicates the effect of Mn on the Cantor Alloy.

Level of Expertise

Expert

Speakers Gender

Male

Do you wish to take part in the poster slam

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