

Al-Based High Entropy Alloys (ACRC)

Researchers:

Y. Zhong
L. Wang
M. Asadikiya
S. Yang
D. Apelian

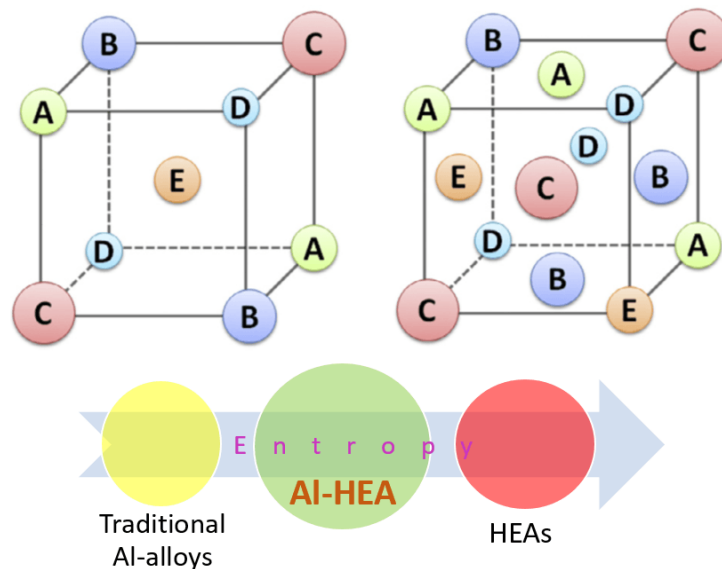
Overview

ACRC has launched an exploratory project to investigate the Al based HEAs. The aim is to develop a new set of alloys with either high stiffness, both good ductility and strength, or excellent creep resistance at high temperatures (>300oC).

The ACRC Al-Based HEA Research Team

Focus Group Members:

Oshkosh Corp. FCA Al Rheinfelden QuesTek Innovations
Category: Funded by ACRC Consortium



Significant progress has been achieved in the past years on the development of new Al-based alloys. However, further improvements are challenging if development is limited to the conventional Al alloy compositional ranges and the trial-and-error approach. There are recent and most interesting efforts on High Entropy Alloys (HEAs), which contain at least 4 principal elements (minimum 5at. % each). It has been discovered that the typical HEAs show promising properties such as high yield strength, fracture toughness, hardness, etc. In addition, there are significant advancements on the adoption of Integrated Computational Material Engineering (ICME) methodologies for alloy design. Such an approach has been successfully used in alloy design, and most importantly results have been obtained rapidly. Mitigating the trial and error approach and obtaining results for quick deployment has been a major development.

