

Development of CoCrFeMnNi-0.18Ti High Entropy Alloy via Electron Beam Melting**Speaker:** Mehmet Cagirci

Department of Materials Science and Engineering, Engineering, NUS, Singapore

Date: 24th Oct 2019, Thursday
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Venue: EA-06-03

Abstract

High entropy alloys (HEAs) are promising materials for a wide range of functional and structural applications due to their exceptional properties. Although some HEAs, such as equiatomic CoCrFeMnNi and CrCoNi-based HEAs, have already been proposed with an impressive mechanical performance, further improvement or development is limited by conventional manufacturing techniques. Recent developments in powder processing techniques, such as achieving high purity elemental and pre-alloyed powders, and employing additive manufacturing technologies, which can control an important part of microstructural formations while fabricating metallic materials, allow us to design and develop promising HEAs. In this work, mechanical mixing of pre-alloyed CoCrFeMnNi and pure Ti powders are employed to reduce the complexity of powder fabrication and the cost of synthesizing high-purity pre-alloyed powder while designing multi-phase structural HEA. Electron beam melting of mechanically blended powder caused homogeneous microstructure as well as the improvement of hardness three times compared to EBM-built pure CoCrFeMnNi HEA.

Mehmet received his B.Sc. and M.Sc. degrees from the Metallurgical and Materials Engineering Department at Middle East Technical University in Turkey. He is currently a Ph.D. candidate in Department of MSE under the supervision of Prof. Ding Jun and Dr. Wei Jun, focusing on the additive manufacturing of metallic materials. His current research is particularly aimed to develop medium- and high-entropy alloys for structural applications.

ALL ARE WELCOME!

Host: A/P Xue Junmin