

Influence of Sintering Temperature on Microhardness and Tribological Properties of Equi-Atomic Ti-Al-Mo-Si-W Multicomponent Alloy

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Abstract : Tribological failure of materials during application can lead to catastrophic events which also carry economic penalties. High entropy alloys (HEAs) have shown outstanding tribological properties in applications such as mechanical parts where moving parts under high friction are required. This work aims to investigate the effect of sintering temperature on microhardness properties and tribological properties of novel equiatomic TiAlMoSiW HEAs fabricated via spark plasma sintering. The effect of Spark plasma sintering temperature on morphological evolution and phase formation was also investigated. The microstructure and the phases formed for the developed HEAs were examined using scanning electron microscopy (SEM) and X-ray diffractometry (XRD) respectively. The microhardness and tribological properties were studied using a diamond base microhardness tester Rtec tribometer. The developed HEAs showed improved mechanical properties as the sintering temperature increases.

Keywords : sintering, high entropy alloy, microhardness, tribology

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