

Paragraph Ran in the Queries

Paper Title: Microstructure evolution and properties of semi-solid Al₈₀Mg₅Li₅Zn₅Cu₅ light weight high entropy alloy prepared by SIMA

Content :

Mechanical properties

The compressive stress-strain curves of Al₈₀Mg₅Li₅Zn₅Cu₅ light weight high entropy alloys are shown in Fig. 11. As shown in Fig. 11, the compressive strength of Al₈₀Mg₅Li₅Zn₅Cu₅ light weight high entropy alloy increases from 496.7 MPa in as-cast state to 558.4 MPa in semi-solid state (treated at 500 °C for 15 min with 20% deformation), which is improved by 11%. And the plastic strain increases from 9.5% to 10.1%, which remains basically unchanged. It is well known that the mechanical properties of alloys are governed by the microstructures. On the one hand, the finer the microstructure, the better the mechanical properties. It can be found the microstructure of semi-solid Al₈₀Mg₅Li₅Zn₅Cu₅ light weight high entropy alloy treated at 500 °C for 15 min with 20% deformation (Fig. 4(c)) is finer than that of as-cast ones (Fig. 1(a)). On the other hand, the globular or near-globular microstructure of the semi-solid alloy will rotate during the compression process, which is beneficial to coordinate the deformation, reduce the stress concentration and improve the compressive strength.