Influence of isothermal multi-axial forging on hardness of magnesium alloy

Abstract

Hardness and micro-structure of AZ31 Mg alloy during IMAF (isothermal multi-axial forging) was studied. This paper discusses the relationship exists between the hardness and microstructures of the samples. The IMAF is carried out in two experiments at the temperatures 320 and 350^0c, as a result, the grain size refined significantly in a subsequent number of passes. The grain structure gradually reduces from the first pass to the third pass; in each pass, the sample is rotated in 90 degrees. Initial grain size is 128μm reduces to about 14μm after three passes due to dynamic recrystallization in a continuous manner. Not only hardness but also tensile strength and percentage of elongation of the alloy are undoubtedly enhanced.