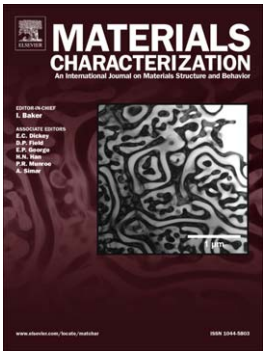

Hot compression deformation behavior of Mg-9Gd-2.9Y-1.9Zn-0.4Zr-0.2Ca (wt%) alloy

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Hot compression deformation behavior of Mg-9Gd-2.9Y-1.9Zn-0.4Zr-0.2Ca (wt.%) alloy

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Abstract

Hot deformation behavior of the homogenized and quenched Mg-9Gd-2.9Y-1.9Zn-0.4Zr-0.2Ca (wt.%) alloy was investigated by compression test at temperatures of 300~500^{o}C and strain rates of 0.001~10s^{-1}. The flow stress is sensitive to the deformation temperature and strain rate, which increases with increasing strain rate and decreasing temperature. The processing map constructed at the strain of 0.9 shows two stability domains with high power dissipation efficiencies and the optimum hot working condition for the alloy is determined as deformation temperature of 450^{o}C and strain rate of 0.01s^{-1}, which correlates with the continuous dynamic recrystallization as main softening mechanism. However, dense