Short Communication

Influence of tensile twinning on electrochemical and corrosion behavior of Mg alloy

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The rolled AZ31 alloy sheet was compressed along the rolling direction to obtain Mg alloy sheets with different volume fractions of $\{10\bar{1}2\}$ tensile twins. Subsequently, the electrochemical and corrosion behavior of the deformed alloys after low temperature annealing were studied by hydrogen evolution tests, weight loss tests and electrochemical methods. The results show that the $\{10\bar{1}2\}$ tensile twins can improve the electrochemical activity and corrosion resistance of the AZ31 alloy. In addition, the self-corrosion rate of the alloy gradually slows down with the continuous increase in deformation amount when the deformation amount of the alloy is 0% and 6%, but that is accelerated on the contrary when the deformation amount is further increased to 9%. In other words, when the deformation amount is less than 6% and the volume fraction of $\{10\bar{1}2\}$ tensile twins is low, the corrosion resistance of the alloy increase with the volume fraction of the $\{10\bar{1}2\}$ tensile twin, but too much volume fraction of $\{10\bar{1}2\}$ tensile twins is not conducive to the improvement of the corrosion resistance of Mg alloy.

Keywords: Mg alloys; Tensile twins; Corrosion resistance

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