

## **Application of the Work Hardening Model for Mechanical Anisotropy Study of AZ31 Magnesium Alloy Sheet**

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### **Abstract**

Applied model is based on a description of the dislocation density evolution in metals with hexagonal structure, where forest dislocations and non-dislocations obstacles are considered as obstacles for primary dislocations. Specimens of different orientations between the tensile axis and the rolling direction were deformed in temperature range from 20-300°C at an initial strain rate of  $10^{-3}$ /s in order to study the microstructure changes during plastic deformation.

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## **Effect of grain refinement on electrochemical characteristics in AE42 magnesium alloy**

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The effect of refinement of microstructure on corrosion of AE42 magnesium alloy was investigated. Electrochemical impedance spectroscopy in normal salinity solution (0.9% NaCl) showed a substantially higher charge transfer resistance in the fine-grained samples processed by equal channel angular pressing (ECAP) as compared to as-extruded material. The corrosion layer on the ECAPed sample was compact and thicker than the layer created on the as-extruded one. The dispersed Al11RE3 particles stabilized the corrosion layer and enhanced the corrosion resistance.