

Study of the Microstructural Evolution and Precipitation Kinetic in AZ91 Alloys

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Abstract : Differential scanning calorimetry (DSC) is a widely used technique for the study of phase transformations, particularly in the study of precipitation. The kinetic of the precipitation and dissolution is always related to the concept of activation energy E_a . The determination of the activation energy gives important information about the kinetic of the precipitation reaction. In this work, we were interested in the study of the isothermal and non-isothermal treatments on the decomposition of the supersaturated solid solution in the alloy AZ91 (Mg-9 Al-Zn 1-0.2 Mn. mass fraction %), using Differential Calorimetric method. Through this method, the samples were heat treated up to 425° C, using different rates. To calculate the apparent activation energies associated with the formation of precipitated phases, we used different isoconversional methods. This study was supported by other analysis: X-ray diffraction and microhardness measurements.

Keywords : calorimetric, activation energy, AZ91 alloys, microstructural evolution

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