

## THERMODYNAMIC ANALYSIS OF THE Cu-Mg-Y SYSTEM AND PREDICTION OF ITS GLASS FORMING ABILITY

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Thermodynamics can be used to perform predictions of the composition range where glass formation is the most probable, thus guiding the search for new alloy compositions. However, the extension to non-equilibrium phases requires suitable modelling and appropriate experimental data<sup>1,2</sup>. Amorphous Mg-rich alloys show high mechanical strength, good corrosion resistance and low density. In particular, the ternary Cu-Mg-Y system has been widely investigated in the latest years because of its good Glass Forming Ability (GFA). In spite of this great interest, only Redlich-Kister-Muggianu extrapolation from the binary systems or calculations using the Miedema model have been reported in the literature<sup>3,4</sup>. A full thermodynamic assessment of the ternary system is still missing.

Aim of this work is to carry out a thermodynamic assessment of the equilibrium ternary system including the description of the amorphous phase. To this purpose, the binary systems have also been reviewed. Both binary and ternary alloys have been prepared. Amorphous samples have also been obtained by rapid solidification for suitable alloy compositions. Experimental results both on equilibrium and non-equilibrium phases have been used in the assessment procedure. Ternary interaction parameters have been introduced in the description of the liquid phase. The agreement between calculated thermodynamic quantities and corresponding experimental data has been significantly improved. Predictions of Glass Forming Ability are also in good agreement with experimental findings.

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