

ADVANCED ALUMINIUM ALLOYS FOR HIGH TEMPERATURE APPLICATION

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Abstract

New aluminium alloys, which exhibit an optimal combination of strength, fatigue resistance, formability and corrosion resistance are desirable for the aluminium industry. One of the most attractive systems for new aluminium alloy is Al–Zn–Mg–Cu system, which is the basic system for development of the strongest wrought alloys of AA7075 type. Alloying elements such as chromium, manganese, and zirconium are added for the control of grain and subgrain structures, which also contribute to the strength.

Paper represents thermodynamic modeling of advanced aluminum alloys with better mechanical properties for high temperature applications. For better visual representation and interpretation of solidification path of studied alloys the thermodynamic predictions are needed for the study of the effect of additions to the thermodynamic stability, crystallization and precipitation kinetics of lightweight alloys. The purpose of this study was to analyze the influence of diferent (Ce, Nd, Zr) addition to the aluminium alloys from thermodynamic point of view.

Keywords: aluminum alloys, thermodynamic modeling, thermal analysis