Consiglio Nazionale delle Ricerche
Istituto per l'Energetica e le Interfasi
U.O.S. di Milano

SEMINARIO

Primary MC carbide decomposition and Low-intermediate Temperature Ductility Minimum

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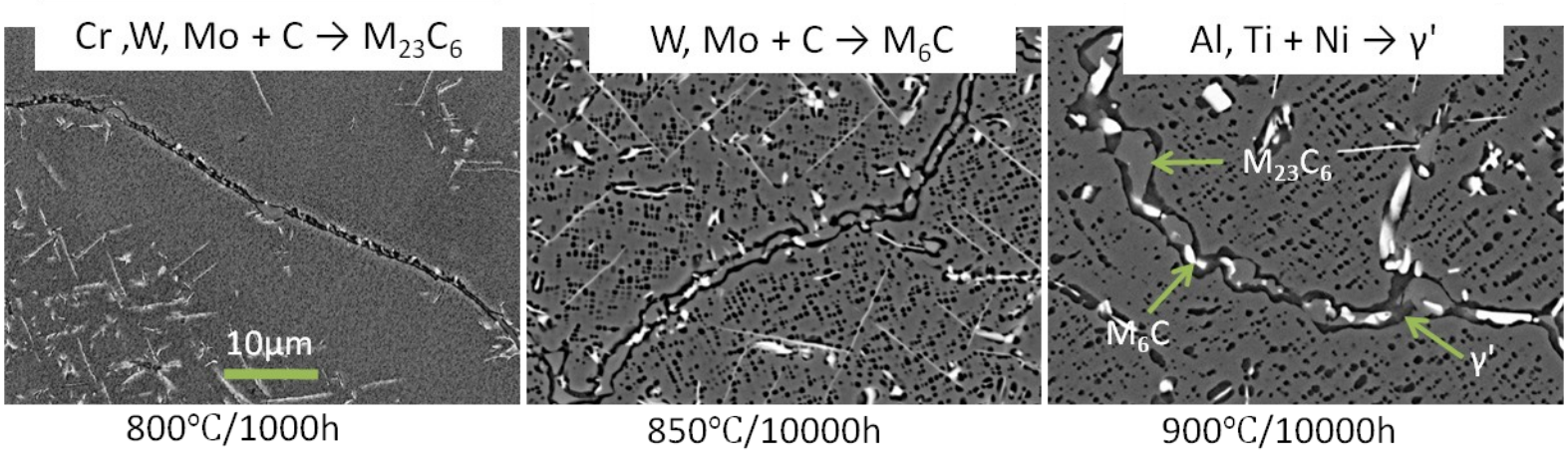

Part I

Primary MC carbide decomposition and its effects on the microstructure and mechanical properties of two Cast Ni-based Superalloys

K452 and K446 alloys are two newly developed cast Ni-base superalloys, designed for structural component applications of gas turbines in industrial fields. The two alloys perform well under laboratory conditions with good physical, chemical and mechanical properties. However, due to the very different compositions, they experience the different degrees of microstructural degenerations when exposed at elevated temperatures.
In this report, the microstructural stabilities and their influences on the mechanical properties of the two alloys were comparatively examined during thermal exposure at temperatures of 800, 850 and 900 ℃ for times of 1000, 3000, 5000 and 10000 h, and the relationships among the chemical composition, microstructural stability and service lifetime were deep revealed.

Part II

Low-intermediate Temperature Ductility Minimum of Several Cast Ni-based Superalloys

The intermediate temperature brittleness (ITB) or ductility minimum (ITDM) of metals and alloys was extensively investigated previously. It generally occurred in polycrystalline (PC) alloys, while not in directionally-solidified (DS) and single crystal (SC) alloys.
For superalloys, limited information is available about the ITDM. Some researchers thought the DM induced by environment embrittlement accorded with the mechanism of ITDM. However, others considered the DM occurring during abnormal yielding as ITDM.
In this part of the talk, the tensile properties of PC, DS and SC superalloys were investigated and a DM always occurred at the low-intermediate temperatures (LITs), called LITDM for short. It seems that the temperatures the LITDM occurred are lower than the ones the so-called ITDM does, and their mechanisms are essentially different.

Informazioni

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