The effect of heat treatment on the structure of Nb and C doped Fe_3Al iron aluminides

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The alloyed iron aluminides with Fe_3Al matrix are used as structural materials. Nb, Zr, Ta additives in combination with carbon appear like promising for high-temperature applications [1, 2]. The carbon addition leads to the formation of carbides (NbC, ZrC, TaC) in the structure of the alloy [2, 3]. The presence of this phase in an appropriate shape could enhance high-temperature mechanical properties of aluminides. The effect of the Nb and C addition and the effect of the heat treatment on the phase composition of this alloy were studied [4, 5]. The alloys investigated in this work were annealed at 1000°C/1h and 1150°C/1h in the air. The phase composition was studied by light optical microscopy (LOM) and scanning electron microscopy (SEM) with energy dispersive analysis (EDX).

Keywords: Fe_3Al type aluminides, Nb and C addition, phase composition, heat treatment

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