The Effect of Aging Heat Treatment on the Microstructure and η Phase Precipitation in Iron Based A286 Superalloy

In this paper, the influence of ageing heat treatment on the microstructure and amount of the eta (η) phase in A286 superalloy has been studied. Artificial aging was performed at temperature range of 500-900 °C for 1-3 hrs. The precipitation of the η phase is investigated by means of optical microscopy, scanning electron microscopy, differential thermal analysis, and X-ray diffractometry. η phase has not been found after the samples being aged at 900 °C and 795 °C. At 795 °C for 8 hrs, cellular η phase has been appeared at grain boundaries and the amount of it has been raised with increasing holding time. This behavior continued up to 820 °C. Widmanstatten η started to nucleate at 820 °C. The η phase starts to precipitate at the expense of the gamma-prime (γ') phase. A timetemperature-precipitation diagram for the η phase is presented. The results show the behavior of η precipitation at 805 °C and 820 °C is different and this behavior is discussed in the article.

Keywords: Aging heat treatment, η phase transformation, Morphology, Fe-Ni base A286 superalloy

A link to the full paper is available: https://www.civilica.com/Paper-ICME12-ICME12_283.html
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