

텅스텐 치환된 2205 이형스테인리스강의 크리프 특성평가
Evaluation of creep properties of W-substituted 2205 duplex stainless steels

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The effect of the substitution of tungsten(W) for molybdenum(Mo) on the microstructure and the creep behaviour of 22Cr-5Ni duplex stainless steel has been investigated. Creep tests were carried out at 600°C and 650°C under the stress range of 264 ~ 300MPa. It is very important to investigate the creep behaviour at the temperature between 600°C and 650°C, because firstly this alloys are often employed for the structural components in high temperature plants such as pressure vessels or sodium circuits in fast breed reactors, and secondly the transformation containing with formation of various kinds of precipitates can come out in this temperature range, which will influence significantly on the creep properties. The substitution of W for Mo in the duplex stainless steel was known to retard the formation of phase due to the lower diffusivity of W compared with Mo. There were different activation energies and stress exponents in the experiments. The high creep strength resulted normally from the stability of the microstructure of steel, which was affected by W-substitution. Creep rupture time was increased with the increase of W content up to 2wt.%. The reason for it could be due to the precipitation of intermetallic compound.

1. Ahn, Y.S. and Kang J.P. : Mat. Sci. Technol., v.14, No.4 (2000) p.382