

反应堆工程

C276合金高温拉伸强度的显微分析

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摘要 C276合金具有优异的高温拉伸强度。为研究C276的高温强化机制, 利用光学显微镜(OM)、扫描电镜(SEM)和X射线衍射(XRD)方法, 分析C276在500~650℃下拉伸断裂的试样。结果表明: C276在500~650℃下拉伸时, 随晶粒尺寸的增大, 屈服强度先增加后减小, 两者不符合Hall-Petch关系。在晶体内观察到了形变孪晶, 未发现沉淀相析出。因此, C276在高温下仍是以固溶强化为主, 可能兼有孪晶强化, 而无细晶强化和沉淀强化的效果。

关键词 [C276](#) [高温拉伸](#) [显微分析](#) [强化机制](#)

分类号

Microstructure Analysis of High-Temperature Tensile Strength of C276 Alloy

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Abstract C276 alloy exhibits an excellent high-temperature tensile strength at 500-650 °C. Optical microscope, scanning electron microscope and X-ray diffraction were used to investigate strengthening mechanisms of C276 alloy. The results show that the yield strength of the specimens does not always decrease with the increasing grain size, which does not match Hall-Petch relation of the grain size strengthening. In addition, some deformation twins and very few precipitated phases are observed in the grains. It can be concluded that good high-temperature tensile strength of C276 arises from co-effects of main solid solution strengthening and possible deformation twin-strengthening, but not fine grain strengthening and precipitation-strengthening.

Key words [C276](#) [high-temperature](#) [tensile](#) [microstructure](#) [analysis](#) [strengthening](#) [mechanism](#)

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