

论文

ODS铁素体合金抗辐照损伤性能

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摘要: 利用电子辐照、离子辐照等多种辐照模拟方法,对机械合金化方法制备的氧化物弥散强化铁素体合金抗辐照损伤性能进行了研究.实验表明:在抗辐照肿胀和抗辐照偏析方面,所研制的材料明显优于对照实验的奥氏体合金;积分通量 $1.7 \times 10^{17} / \text{cm}^2$ 氩离子注入,引起表层起泡、龟裂,劣于对照材料,辐照后初脆转变温度高于Fe-13%Cr合金,存在轧制造成的强度各向异性问题,材料韧性有待提高.

关键词: 氧化物弥散强化 铁素体合金 辐照损伤

PROPERTY OF RESISTANCE TO IRRADIATION DAMAGE OF ODS FERRITIC ALLOYS

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Abstract: The property of resistance to irradiation swelling of oxide dispersion strengthened(ODS) ferritic alloys,prepared by mechanical alloying(MA), has been studied by means of electron and ion irradiation simulations.The results showed that ODS alloys are superior to austenitic alloys in the resistance to irradiation swelling and segregation. After high influx of  $1.7 \times 10^{17}/\text{cm}^2$  argon ions implantation,bubbles were formed and the top of which chapped slightly on individual sections of the ODS material surface.In addition, ductile-to-brittle transition temperature(DBTT) of ODS alloys were higher than that of Fe-13%Cr alloy. There existed anisotropy of strength induced by rolling.Therefore,ductility of ODS needed to be enhanced.

Keywords: oxide dispersion strengthening ferritic alloy irradiation damage

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