

反应堆工程

U-Mo合金与Nb的互扩散行为

庞晓轩^{1,2}, 尹昌耕², 沈保罗¹, 孙长龙², 陈建刚², 杨红艳², 孙旭东²

1.四川大学 材料科学与工程学院, 四川 成都 610064 2.中国核动力研究设计院, 四川 610041

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摘要 采用包覆热轧法制备U-Mo/Nb固相复合扩散偶, 在760 °C下对U-Mo/Nb固相复合扩散偶进行不同时间(3~15 h)的扩散热处理, 得到了不同厚度的扩散层。对热处理时间与扩散层厚度间的关系进行了线性拟合, 观察到扩散层生长起初具有一段孕育期。对热处理后扩散层进行了SEM分析和EDS分析, 初步讨论了扩散偶长时间热处理后靠近U-Mo合金一侧出现裂纹的原因。对扩散偶热处理后扩散组元分布进行了深入分析, 观察到长时间的热处理扩散层厚度的增加只是U元素在Nb基体中的均匀化过程。

关键词 [固相复合](#) [U-Mo合金](#) [扩散偶](#) [热处理](#)

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Diffusion Behavior of U-Mo Alloy With Nb

PANG Xiao-xuan^{1,2}, YIN Chang-geng², SHEN Bao-luo¹, SUN Chang-long², CHEN Jian-gang², YAN Hong-yan², SUN Xu-dong²

1. College of Materials Science and Engineering, Sichuan University, Chengdu 610064, China; 2. Nuclear Power Institute of China, Chengdu 610041, China

Abstract Solid bonding diffusion couple of U-Mo/Nb was prepared by covering and hot rolling. The diffusion couple was heat-treated at 760 °C for different time (3-15 h) and different thickness diffusion layers were gained. In order to match the relationship of heat-treated time with diffusion layer thickness, line fitting was performed. The result shows that the growth of diffusion layer has a process for gestation in the first instance. The diffusion layer was observed by means of SEM and EDS. The diffusion phenomenon of crackle at the side of U-Mo alloy after long-time heat-treatment is primary studied and discussed. The element in diffusion couple after heat-treatment was analyzed. The results indicate that the thickness increase of the diffusion layer is just the U element homogenize in Nb baseplate after long-time heat-treatment.

Key words [solid bonding](#) [U-Mo alloy](#) [diffusion couple](#) [heat-treatment](#)

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