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技术及应用

空心玻璃微球D_2/Ne混合气体充气工艺

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摘要 本工作主要研究空心玻璃微球对D_2和Ne气体渗透系数的差异，以及研究采用热扩散法在高压充气系统上向空心玻璃微球充入D_2/Ne混合气体的充气工艺。利用干涉条纹法测量了在充气和保气时Ne的气体渗透系数，它们分别为 $K_{Ne,350℃}=2.6\times10^{-18}$和$K_{Ne,25℃}=8.0\times10^{-22}$ mol•m^{-1}•s^{-1}•Pa^{-1}。根据D_2的气体渗透系数确定了玻璃微球充D_2/Ne混合气体的充气方法和充气平衡时间，平衡时间以充纯Ne时间为准。此外，还研究了空心玻璃微球充入混合气体后的保气性能。

关键词 空心玻璃微球 气体渗透系数 D_2/Ne混合气体

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Technology of Filling Hollow Glass Microsphere With D_2/Ne

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Abstract The hollow glass microsphere(HGM) is one of targets used in inertial confinement fusion(ICF) experiments,and it is filled with the fuel gas and the diagnosis gas, such as mixture of D_2 and Ne. In order to control the D_2-Ne ratio of mixed gas and total pressure in the HGM, the Ne permeability and the permeability difference between Ne and D2 in the HGM are studied. The primary experiments show that Ne permeability is 2.6×10^{-18} and 8.0×10^{-22} mol•m^{-1}•s^{-1}•Pa^{-1} at 350 and 25℃, respectively. It is concluded that D_2/Ne filling time is determined by the Ne permeability because the Ne permeability is small at 350 ℃. On the basis of these experiments， the HGM was filled with the mixture of D_2 and Ne.

Key words hollow glass microsphere gas permeability _ D_2/Ne mixed gas

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