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吸气剂材料的吸氢动力学理论

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摘要 以非蒸散型吸气剂材料为研究对象,提出了一种吸氢动力学的基本模型。氢的吸入过程将由表面吸附、表层渗透和体内扩散3步组成。通常情况下,必须对它们的动力学方程同时求解。在氢通过化学解离吸附进入体内(亚表面层)的吸入过程中,表面势垒对氢从表面渗透至体内的障碍作用不可忽略。在低的体氢浓度条件下,采用晶格 气体模型描述体扩散过程,并讨论了影响吸气速率的因素。

关键词 吸气剂 吸氢动力学 表面势垒

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Kinetic Theory of Hydrogen Uptake for Getter Materials

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Abstract In the paper the kinetics of hydrogen absorption was studied, and a basic model was presented for the non-evaporable getter material. It is believed that hydrogen uptake process of getters should be composed of three intermediate partial steps: dissociative chemisorption on the surface, surface penetration to the bulk, and diffusion in the body. The potential barrier at the surface for adsorbed hydrogen atoms transporting to the bulk (subsurface layer) can not be neglected. Under the normal conditions, these processes must be considered and their kinetic equations should be solved simultaneously. For low hydrogen bulk concentration a lattice-gas model was adopted to describe the diffusion behavior of hydrogen in the bulk. Influence of some factors on hydrogen (absorption) rate was also discussed.

Key words getter kinetics of hydrogen uptake surface barrier

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