

技术及应用

## 贮氢金属多层膜制备技术及吸氢性能研究

刘锦华; 丁伟; 梁建华

中国工程物理研究院 核物理与化学研究所, 四川 绵阳 621900

收稿日期 修回日期 网络版发布日期:

**摘要** 研究了用电子束蒸发方法在Mo底衬上制备Ti-Ni复合膜和在SiO<sub>2</sub>底衬上制备Mo-Ti-Ni复合膜的方法, 用离子束分析方法测量了各膜层的厚度, 并对样品的吸氢性能进行了分析。研究发现, Ti膜表面镀Ni后, 其吸氢温度降低, 吸氢总量增加, 表明其吸氢活性增强; Mo-Ti-Ni复合膜在Ti氢化后与SiO<sub>2</sub>底衬结合良好, 并具有较高的强度, 但这种膜对底衬的清洁度要求更高; 50 nm的Ti膜难以吸氢, 原因可能是膜制备过程中温度过高, 导致Mo-Ti-Ni之间扩散加深, 形成相对过厚的过渡层, 这还需进一步研究。

关键词 [贮氢金属](#) [镀膜](#) [复合膜](#) [吸氢](#)

分类号

## Preparation of Multi-layer Film About Hydrogen Storage Metal and Its Hydrogenation Character Study

LIU Jin-hua; DING Wei; LIANG Jian-hua

Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang 621900, China

**Abstract** Multiple film preparation of Ti-Ni on Mo and Mo-Ti-Ni on SiO<sub>2</sub> substrate with the method of electron beam physical vapor deposition was studied. The depth of every layer of the film was measured by using ion beam analysis method, and the hydrogenation character of the samples were analyzed as well. It is found that the Ti-Ni film hydrogenated temperature is lower and hydrogenated ratio is higher than Ti film which shows a higher activity. The Mo-Ti-Ni film can still combine tightly with the SiO<sub>2</sub> substrate after hydrogenation, while the substrate is cleaned more carefully. It is more difficult for the 50 nm Ti film to be hydrogenated because of the high temperature during the film preparation, which may induce a deeper diffusion among Ti, Mo and Ni to generate a thicker transition zone between Ti and Mo or Ti and Ni.

**Key words** [hydrogen storage metal film preparation multi-layer film hydrogenation](#)

DOI

### 扩展功能

#### 本文信息

- ▶ [Supporting info](#)
- ▶ [\[PDF全文\]\(333KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

#### 服务与反馈

- ▶ [把本文推荐给朋友](#)

#### 相关信息

- ▶ [本刊中包含“贮氢金属”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [刘锦华](#)
- [丁伟](#)
- [梁建华](#)

通讯作者