

技术及应用

制备工艺对自支撑薄膜粗糙度的影响

郑瑞廷, 高凤菊, 郁静, 程国安

北京师范大学 射线束技术与材料改性教育部重点实验室, 北京师范大学 材料科学与工程系 低能核物理研究所, 北京市辐射中心, 北京 100875

收稿日期 2007-11-6 修回日期 2007-12-25 网络版发布日期: 2008-10-20

摘要 利用磁过滤等离子沉积技术, 以甜菜碱、油酸钾、抛光NaCl单晶基片、自支撑火棉胶膜和自支撑SiN薄膜为衬底制备了自支撑Ni膜。采用原子力显微镜和场发射扫描电子显微镜对薄膜表面形态和粗糙度进行了分析。结果表明: 自支撑Ni膜的粗糙度与衬底材料密切相关, 等离子体的沉积角度直接影响纳米薄膜的微观结构, 采用60°倾斜沉积在自支撑火棉胶膜衬底上, 可获得表面粗糙度为1.5 nm的自支撑Ni膜。

关键词 [磁过滤等离子沉积](#); [自支撑薄膜](#); [表面粗糙度](#)

分类号 [O484.5](#)

Effect of Preparation Process on Roughness of Self-supporting

ZHENG Rui-ting, GAO Feng-ju, YU Jing, CHENG Guo-an

Key Laboratory of Radiation Beam Technology and Material Modification of Education Ministry, Department of Materials Science & Engineering, Beijing Normal University, Beijing Radiation Center, Beijing 100875, China

Abstract Metal vapor vacuum arc ion deposition system was adapted to prepare self-supporting Ni films on substrates of betaine-sucrose/Si, potassium oleate/Si, potassium oleate-sucrose/Si, self-supporting collodion film, polished NaCl and self-supporting SiN film, respectively. Field emission scanning electron microscopy (FESEM) and atomic force microscope (AFM) were employed to analyze the surface morphology and roughness of the films and substrates. The result indicates that the mean roughness of the self-supporting Ni film depends on its depositing substrate. Glancing angle deposition can reduce the surface roughness of film. Self-supporting Ni film with the 1.5 nm mean surface roughness was obtained on self-supporting collodion film with 60° glancing angle.

Key words [metal](#) [vapor](#) [vacuum](#) [arc](#) [ion](#) [deposition](#) [self-supporting](#) [film](#) [surface](#) [roughness](#)

DOI

通讯作者

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [\[PDF全文\]\(1135KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

相关信息

- ▶ 本刊中 [包含“磁过滤等离子沉积; 自支撑薄膜; 表面粗糙度”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [郑瑞廷](#)
- [高凤菊](#)
- [郁静](#)
- [程国安](#)