

论文

多晶沉积薄膜生长过程中织构演变的模拟研究

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摘要: 将织构组态熵的概念应用于沉积多晶薄膜织构演变的模拟研究,考虑薄膜沉积过程中晶体表面能各向异性及应变能各向异性的变化,建立了沉积薄膜晶体择优生长的定量模型;模拟了Al多晶薄膜沉积过程中晶体的生长规律,分析了织构演变的主要微观物理因素.

关键词: 多晶薄膜 织构演变 组态熵

COMPUTER SIMULATION ON TEXTURE EVOLUTION OF POLYCRYSTALLINE THIN FILMS DURING GRAIN GROWTH

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Abstract: The concept of texture configuration entropy is introduced into the computer simulation on texture evolution of polycrystalline films. The grain orientation distribution in thin films is quantitatively determined by a new simple model. As an example, inverse pole figures of polycrystalline aluminum thin films are simulated by considering the change of texture configuration entropy and another orientation dependent driving forces during grain growth, such as surface energy and strain energy. The physical mechanisms affecting the texture evolution of polycrystalline thin films are discussed.

Keywords: polycrystalline thin film texture evolution configuxation entropy

收稿日期 1998-03-18 修回日期 1998-03-18 网络版发布日期

DOI:

基金项目:

国家自然科学基金!59672020;;辽宁省科学技术委员会资助

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参考文献:

1Carel R, Thompson C V, Frost H J. Acta Mater, 1996; 44: 2479
2Waner F, Lamm L, Deparis D. Textures Microstruct, 1995; 23: 249
3Li D Y, Szpunar J. Mater Sci Forum, 1994; 157-162: 1827
4Liu Y D, Wang Y D, Xu J Z, Hu X T. In: Liang Zhide, Zuo Liang eds., Proc 11th Int Coof onTedure of Materiais (ICOTOM-11), Vol.II, Xi'an, 1996: 1165
5Wang F, Xu J Z, Liang Z D. Pme 9th Int Coof on Textures of Materiale(JCOTOM-8), TheMetallurgical Society, Santa Fe, USA, 1987: 110
6王沿东,徐家桢金属学报,1995;31:B550(Wang Yandong, XU Jiazhen. Acta Metall Sin, 1995; 31: B550)
7Wang Y D, Liu Y D, Xu J Z, Liang Z D. J Appl Phys, 1996; 79: 7376

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8Wang Y D, Vadon A, Heizmann J J, Xu J Z. *Scr Mater*, 1996; 35: 905

9陈仁烈统计物理引论北京:人民教育出版社,1959:104(Chen Renlie. *The Intnduction Of Statistical Physics*.

Beijing: People's Education Press, 1959: 104)

10Mackenzie J K, Moore A J W, Nicholas J F. *i Phys Chem Solids*, 1962; 23: 185

11Baskes M I. *Phys Rev*, 1992; B46: 2727

12Daw M S, Baskes M I. *Phys Rev Lett*, 1983, 50: 1285

13Klokholm E, Berry B S. *J Eelectrochem Soc*, 1968;115: 823

14Bassett G A, Menter J W, Bashley D W. *Proc R Soc London*, 1958; A246: 345

15Toth L S, Gilormini P, Jonas J J. *Acta Metall*, 1988; 36: 3077

16Braun J, Sambridge M. *Nature*, 1995; 376: 6542

17Li D Y, ffecaniere C, Das S, Szpunar J A. *Mater Sci Forvm*, 1994; 157-162: 555

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