

## 用As离子注入法生成Nb(As)超导膜实验研究

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**摘要** 用150keV的As离子大剂量注入到铌膜上,在一定条件下制备了超导膜。其超导转变温度为 6.6 K。注入层的厚度约 67 nm,用迭代扣谱法求得了此层中的砷浓度分布,得到了Nb与As原子浓度的比值为2.2。此样品是富铌的Nb(As)超导膜,其超导转变温度比理想的Ti<sub>3</sub>P结构的Nb<sub>3</sub>As(T<sub>c</sub>=0.3 K)高 6.3 K。

**关键词** [转变温度T<sub>c</sub>](#) [迭加扣谱法](#)

分类号

## A ATUDY ON SUPERCONDUCTING FILMS OF Nb(As) PRODUCED BY ARSENIC ION IMPLANTATION

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**Abstract** Superconducting film is prepared by implanting high dose As ions with 150keV into Nb film on the microcrystallite glass substrates, and annealing at the temperature of 800°C for 30 minutes. in the vacuum of  $1.3 \times 10^{-5}$  Pa. The superconducting transition temperature,  $T_c$ , equals 6.6K. The thickness of implantation layer is about 67 nm. The concentration profile of arsenic in the implantation layer is measured by iterative subtracting backscattering spectrum method. The concentration ratio of Nb atom to As atom,  $N_{(Nb)}/N_{(As)}=2.2$ , is obtained. Consequently, the sample is not an ideal Nb<sub>3</sub>As of Ti<sub>3</sub>P configuration but a Nb rich superconductor film of Nb(As). However, its superconducting transition temperature is higher than that of Nb<sub>3</sub>As of Ti<sub>3</sub>P type. The latter's transition temperature is 0.3 K only.

**Key words** [Transition temperature](#) [Iterative subtraction of spectra](#)

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