

论文

## 氧作用下浸渍钡钨阴极中钙的强化表面扩散

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摘要

由于探测技术上的困难, 至今对钡钨钙扩散阴极表面钙的研究极少。本文利用低压氧诱导下Ca向阴极表面的强化扩散, 并借助俄歇电子能谱仪探索了Ca的行为和作用。主要结果是: (1) 相当部分Ca以金属态形式存在于钨孔隙中活性物质的近表层区; (2) 钙向表面扩散的数量和速度与阴极温度、氧的暴露量成正比, 它是一种界面反应驱动下的强化扩散, 其激活能约为1.34eV; (3) 氧作用下阴极表面氧化钙的增加是导致阴极发射衰减的重要原因, 而恢复中毒的再激活机制之一, 则是高温下表面钙的蒸发逸离过程。

关键词 [扩散阴极](#) [浸渍钡钨阴极](#) [表面扩散](#) [俄歇电子能谱](#)

分类号

## CALCIUM SURFACE DIFFUSION IN IMPREGNATED CATHODE ENHANCED BY OXYGEN

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Abstract

The Ca behavior of an impregnated cathode is studied with enhanced diffusion of Ca to the cathode surface induced by low pressure oxygen, and the changes of surface composition are analysed with AES and the method of surface accumulation. The experimental results show that: (1) a significant part of Ca exist in metallic form in the near surface region of the active material in the pores of impregnated cathode; (2) the diffusion rate of Ca to the surface is proportional to the O<sub>2</sub> exposure quantity and the cathode temperature, the activation energy of Ca surface diffusion enhanced by O<sub>2</sub> is about 1.34eV; (3) one of the reasons of emission decay under oxygen effect may be considered due to the increase of calcium oxide on the cathode surface, and the one of principal mechanisms of the seactivation is the high temperature cleaning process of the Ca by evaporation.

Key words [Dispenser cathode](#) [Impregnated Ba-W cathode](#) [Surface diffusion](#) [AES](#)

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