

## 阴极蒸发物电子发射现象的研究

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## Study on Electron Emission Phenomenon of Cathode Evaporator

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摘要

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**摘要** 为研究钨钨阴极蒸发物的电子发射现象,采用一种新设计的测试装置,对沉积在多晶钨表面上阴极蒸发物的电子发射曲线进行了采集,利用电子发射显微镜和扫描电镜对蒸发物沉积层的电子发射像、表面形貌和成分进行了分析。结果表明,电子发射曲线分3段,即陡升段、快升段和缓升段。分析认为,发射曲线的3段依次对应着多晶钨表面的晶界及划痕发射、晶面发射和3维岛状发射。实践证明,在覆膜阴极表面构造均匀弥散分布的岛状晶体发射点,可大幅度提高阴极的电子发射性能。

**关键词:** 电子发射 钨钨阴极 阴极蒸发物 多晶钨

**Abstract:** In order to study electron emission phenomenon of cathode evaporator, a new designed test device is used to collect the electron emission curve of evaporator deposited on polycrystalline tungsten surface, Electron emission microscope and SEM are used to analyze electron emission image, surface appearance and composition. The results show that the emission curve can be divided into three stages, namely sharp-rise stage, fast-rise stage and slow-rise stage, which correspond to electron emission of grain boundaries and scratches, grain surfaces and three-dimensional islands sequentially. It is proved that electron emission performance of M-type cathodes can be greatly improved by building uniformly dispersed island-shape crystal emission spots.

**Keywords:** Electron emission Barium tungsten cathode Cathode evaporator Polycrystalline tungsten

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