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研究简报

测量热阴极次级电子发射的新方法及其应用

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摘要
本文利用相关检测技术, 并对测试管结构作了改进, 很好地抑制了热电子本底及空间电荷效应, 构成一种测量热阴极在工作温度下次级电子发射性能的新方法。以浸渍钪酸盐阴极为样品, 测得在低的轰击电子能量和电子流情况下次级电子发射系数δ占随温度指数上升; 轰击电子能量或轰击电子流较大时, 温度对δ没有很大的影响。研究表明高温下钪酸盐阴极存在电子轰击热发射增大效应, 对此本文提出“内建场模型”加以解释。

关键词 热阴极 次级电子发射测量方法 钪酸盐阴极 内建场模型

分类号

A NEW METHOD FOR MEASURING THE SECONDARY ELECTRON EMISSION OF THERMIONIC CATHODE AND ITS APPLICATION

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Abstract
By using correlation-detection technique and improving the structure of test tube, the background noise of thermionic-electrons and space charge effect are restrained. The secondary emission coefficient δ of thermionic cathode at high temperature have been studied. The δ of impregnated scandate cathodes increases exponentially with increasing temperature at low energy and current of bombardment electron; at high energy or current of bombardment electron, the temperature has little effect to δ. The research shows that an enhanced thermionic emission occured when the cathode works in high temperature and at electron bombardment. These phenomena are discussed in terms of "internal field model".

Key words Thermionic cathode Method for measuring secondary electron emission Sc-andate cathode Internal field model

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