

论文

用红外测温仪观察二极管板流引起的阴极降温现象

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摘要:

为了观察由板流引起的灯丝温度下降现象, 利用红外测温仪对理想二极管灯丝温度作了精密测量。由于忽略了板流, 导致阴极灯丝温度下降, 致使测得的金属逸出功存在着大约-1.86%的系统相对误差。实验验证了当灯丝电流和板流较小时, 测不出灯丝温度随板流的变化。当灯丝电流为0.74A以上时, 可以明显地观察到输出板流后, 灯丝温度要比板流为0时低(1~2)K, 此结果与预测值十分相符。

关键词: 红外测温 板流 灯丝温度

Observation of cathode temperature-drop phenomenon caused by diode board-current with IR thermometer

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Abstract:

In order to observe the phenomenon of the filament temperature drop caused by the board-current, the ideal diode filament temperature was detected precisely with an infrared thermometer. Since the cathode filament temperature drop caused by the boardcurrent was neglected, it resulted in about-1.86% system relative error in the measured metal work function. The phenomenon was found through a theoretical analysis, and it was verified by an experiment. When both the filament current and board-current are lower, the variation of the filament temperature with the board-current is not measurable; when the filament current is above 0.74A, it can be clearly observed that the filament temperature is (1~2)K lower than that of zero board-current after the board-current is outputted.

Keywords:

infrared thermometry board-current filament temperature

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