光电效应测定普朗克常数

数据处理实验报告

五、数据处理

① 原始数据（）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 波长 | | 365 | 405 | 436 | 546 | 577 |
| 频率 | | 8.214 | 7.408 | 6.879 | 5.490 | 5.196 |
| 截止电压 | 手动 | 1.829 | 1.481 | 1.273 | 0.672 | 0.503 |
| 自动 | 1.830 | 1.478 | 1.272 | 0.672 | 0.502 |

作图为：

可见，与成线性关系，爱因斯坦方程成立。

② 图示法求直线的斜率

可得：#s1-k#，#s1-h#，相对误差#s1-eta# %

③ 线性回归法计算普朗克常数

设回归直线为，其中，，。

则4.342563e-29，0.9995

，与图示法结果比较相对误差5.0 %

④ 不同频率下的伏安特性曲线

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|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | -1 | 4 | 9 | 14 | 19 | 24 | 29 | 34 | 39 | #1-uX# |
|  | 1.1 | 13.1 | 25.7 | 35.1 | 42.6 | 49.5 | 53 | 55.4 | 58.1 | #1-iX# |

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|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | -1 | 4 | 9 | 14 | 19 | 24 | 29 | 34 | 39 | #2-uX# |
|  | 0.3 | 5.6 | 10.1 | 14 | 16.1 | 18.5 | 19.2 | 20.6 | 21.3 | #2-iX# |

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|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | #3-uX# |
|  | 2.2 | 13.9 | 21.4 | 28.6 | 32 | 37 | 39.7 | 40.2 | 41 | #3-iX# |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | #4-uX# |
|  | 0.5 | 5.7 | 8.5 | 10 | 11.1 | 11.6 | 11.9 | 12.2 | 12.4 | #4-iX# |