|  |  |  |  |
| --- | --- | --- | --- |
| 姓名： | 学号： | 班级： | 成绩： |
| 实验名称：太阳能电池基本特性测定 | | | |
|  | | | |

一、实验仪器

(4分)本实验使用的实验仪器和器材有{{choice\_1}}.

A.太阳能电池板、电容表、示波器

B.太阳能电池板、电感表、白炽灯

C.太阳能电池板、电压表、白炽灯

D.太阳能电池板、示波器、白炽灯

二、实验目的

本实验的实验目的是(12分)

1.有光照时，测量太阳能电池在不同{{choice\_2}}下，{{choice\_3}}与电流变化关系，画出曲线.

2.测量太阳能电池的短路电流,开路电压,最大输出功率及 {{choice\_4}} .

A.太阳能电池

B.负载电阻

C.电压

D.填充因子

三、原理简述(24分)

光照射在半导体 {{choice\_5}} 结上，形成新的空穴-电子对，在 {{choice\_6}} 结电场的作用下，空穴由 {{choice\_7}} 区流向 {{choice\_8}} 区，电子由 {{choice\_9}} 区流向 {{choice\_10}} 区，接通电路后就形成电流，这就是光伏效应太阳能电池的工作原理.

A．p-n-p

B．p-n

C．p

D．n

四、实验内容及数据处理

1.不同负载电阻时太阳能电池的输出电压，计算功率 ，结果填入表1.

表1.不同负载时太阳能电池的输出电压和功率().

|  |  |  |
| --- | --- | --- |
|  | I组 | I组 |
| 50 | {{table1\_1}} | {{table1\_2}} |
| 100 | {{table1\_3}} | {{table1\_4}} |
| 200 | {{table1\_5}} | {{table1\_6}} |
| 300 | {{table1\_7}} | {{table1\_8}} |
| 400 | {{table1\_9}} | {{table1\_10}} |
| 500 | {{table1\_11}} | {{table1\_12}} |
| 600 | {{table1\_13}} | {{table1\_14}} |
| 700 | {{table1\_15}} | {{table1\_16}} |
| 800 | {{table1\_17}} | {{table1\_18}} |
| 900 | {{table1\_19}} | {{table1\_20}} |
| 1000 | {{table1\_21}} | {{table1\_22}} |
| 1100 | {{table1\_23}} | {{table1\_24}} |
| 1200 | {{table1\_25}} | {{table1\_26}} |
| 1300 | {{table1\_27}} | {{table1\_28}} |
| 1400 | {{table1\_29}} | {{table1\_30}} |
| 1500 | {{table1\_31}} | {{table1\_32}} |
| 1600 | {{table1\_33}} | {{table1\_34}} |
| 1700 | {{table1\_35}} | {{table1\_36}} |
| 1800 | {{table1\_37}} | {{table1\_38}} |
| 1900 | {{table1\_39}} | {{table1\_40}} |
| 2000 | {{table1\_41}} | {{table1\_42}} |

画出曲线图，求出.

=

2.不同输出电压时太阳能电池的负载电阻，计算输出电流，结果填入表2.

表2.不同输出电压时太阳能电池的输出电流与负载电阻().

|  |  |  |
| --- | --- | --- |
|  | I组 | I组 |
| 0.5 | {{table2\_1}} | {{table2\_2}} |
| 1.0 | {{table2\_3}} | {{table2\_4}} |
| 1.5 | {{table2\_5}} | {{table2\_6}} |
| 2.0 | {{table2\_7}} | {{table2\_8}} |
| 2.5 | {{table2\_9}} | {{table2\_10}} |
| 3.0 | {{table2\_11}} | {{table2\_12}} |
| 3.5 | {{table2\_13}} | {{table2\_14}} |
| 4.0 | {{table2\_15}} | {{table2\_16}} |
| 4.5 | {{table2\_17}} | {{table2\_18}} |
| 5.0 | {{table2\_19}} | {{table2\_20}} |
| 5.1 | {{table2\_21}} | {{table2\_22}} |
| 5.2 | {{table2\_23}} | {{table2\_24}} |
| 5.3 | {{table2\_25}} | {{table2\_26}} |
| 5.4 | {{table2\_27}} | {{table2\_28}} |
| 5.5 | {{table2\_29}} | {{table2\_30}} |
| 5.6 | {{table2\_31}} | {{table2\_32}} |
| 5.7 | {{table2\_33}} | {{table2\_34}} |
| 5.8 | {{table2\_35}} | {{table2\_36}} |
| 5.9 | {{table2\_37}} | {{table2\_38}} |
| 6.0 | {{table2\_39}} | {{table2\_40}} |
| 6.1 | {{table2\_41}} | {{table2\_42}} |
| 6.2 | {{table2\_43}} | {{table2\_44}} |
| 6.3 | {{table2\_45}} | {{table2\_46}} |
| 6.4 | {{table2\_47}} | {{table2\_48}} |
| 6.5 | {{table2\_49}} | {{table2\_50}} |
| 6.7 | {{table2\_51}} | {{table2\_52}} |
| 6.8 | {{table2\_53}} | {{table2\_54}} |

画出曲线图，求出，.

=

=

填充因子:

(20分); (30分); (20分)

3.不同负载电阻时太阳能电池的输出电压，计算功率 ，结果填入表3.

表3.不同负载时太阳能电池的输出电压和功率().

|  |  |  |
| --- | --- | --- |
|  | II组 | II组 |
| 50 | {{table3\_1}} | {{table3\_2}} |
| 100 | {{table3\_3}} | {{table3\_4}} |
| 200 | {{table3\_5}} | {{table3\_6}} |
| 300 | {{table3\_7}} | {{table3\_8}} |
| 400 | {{table3\_9}} | {{table3\_10}} |
| 500 | {{table3\_11}} | {{table3\_12}} |
| 600 | {{table3\_13}} | {{table3\_14}} |
| 700 | {{table3\_15}} | {{table3\_16}} |
| 800 | {{table3\_17}} | {{table3\_18}} |
| 900 | {{table3\_19}} | {{table3\_20}} |
| 1000 | {{table3\_21}} | {{table3\_22}} |
| 1100 | {{table3\_23}} | {{table3\_24}} |
| 1200 | {{table3\_25}} | {{table3\_26}} |
| 1300 | {{table3\_27}} | {{table3\_28}} |
| 1400 | {{table3\_29}} | {{table3\_30}} |
| 1500 | {{table3\_31}} | {{table3\_32}} |
| 1600 | {{table3\_33}} | {{table3\_34}} |
| 1700 | {{table3\_35}} | {{table3\_36}} |
| 1800 | {{table3\_37}} | {{table3\_38}} |
| 1900 | {{table3\_39}} | {{table3\_40}} |
| 2000 | {{table3\_41}} | {{table3\_42}} |

画出曲线图，求出.

=

4.不同输出电压时太阳能电池的负载电阻，计算输出电流，结果填入表4.

表4.不同输出电压时太阳能电池的输出电流与负载电阻().

|  |  |  |
| --- | --- | --- |
|  | II组 | II组 |
| 0.5 | {{table4\_1}} | {{table4\_2}} |
| 1.0 | {{table4\_3}} | {{table4\_4}} |
| 1.5 | {{table4\_5}} | {{table4\_6}} |
| 2.0 | {{table4\_7}} | {{table4\_8}} |
| 2.5 | {{table4\_9}} | {{table4\_10}} |
| 3.0 | {{table4\_11}} | {{table4\_12}} |
| 3.5 | {{table4\_13}} | {{table4\_14}} |
| 4.0 | {{table4\_15}} | {{table4\_16}} |
| 4.5 | {{table4\_17}} | {{table4\_18}} |
| 5.0 | {{table4\_19}} | {{table4\_20}} |
| 5.1 | {{table4\_21}} | {{table4\_22}} |
| 5.2 | {{table4\_23}} | {{table4\_24}} |
| 5.3 | {{table4\_25}} | {{table4\_26}} |
| 5.4 | {{table4\_27}} | {{table4\_28}} |
| 5.5 | {{table4\_29}} | {{table4\_30}} |
| 5.6 | {{table4\_31}} | {{table4\_32}} |
| 5.7 | {{table4\_33}} | {{table4\_34}} |
| 5.8 | {{table4\_35}} | {{table4\_36}} |
| 5.9 | {{table4\_37}} | {{table4\_38}} |
| 6.0 | {{table4\_39}} | {{table4\_40}} |
| 6.1 | {{table4\_41}} | {{table4\_42}} |
| 6.2 | {{table4\_43}} | {{table4\_44}} |
| 6.3 | {{table4\_45}} | {{table4\_46}} |
| 6.4 | {{table4\_47}} | {{table4\_48}} |
| 6.5 | {{table4\_49}} | {{table4\_50}} |
| 6.7 | {{table4\_51}} | {{table4\_52}} |
| 6.8 | {{table4\_53}} | {{table4\_54}} |

画出曲线图，求出，.

=

=

填充因子:

(20分); (30分); (20分)