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| 五、数据记录：  组号： 19 ；姓名 吴艇  1.霍尔器件输出特性测量  ①实验仪双刀开关倒向“”，测试仪功能选择置于“”，然后调节，测绘曲线。   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  | | 1.00 | 2.4 | -2.67 | 2.65 | -2.41 | 2.53 | | 1.50 | 3.59 | -3.99 | 3.97 | -3.61 | 3.79 | | 2.00 | 4.79 | -5.32 | 5.3 | -4.81 | 5.06 | | 2.50 | 5.96 | -6.62 | 6.6 | -5.98 | 6.29 | | 3.00 | 7.17 | -7.96 | 7.94 | -7.19 | 7.57 | | 3.50 | 8.36 | -9.28 | 9.26 | -8.38 | 8.82 | | 4.00 | 9.56 | -10.6 | 10.59 | -9.58 | 10.08 |   ②保持的值不变()，测绘曲线   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  | | 0.300 | 4.16 | -4.89 | 4.87 | -4.12 | 4.51 | | 0.400 | 5.64 | -6.41 | 6.39 | -5.64 | 6.02 | | 0.500 | 7.14 | -7.95 | 7.93 | -7.18 | 7.55 | | 0.600 | 8.69 | -9.48 | 9.46 | -8.68 | 9.08 | | 0.700 | 10.2 | -11.01 | 10.99 | -10.24 | 10.61 | | 0.800 | 11.76 | -12.54 | 12.52 | -11.76 | 12.15 |   2.测量螺线管轴线上磁场分布()   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  |  | | 20 | 0.42 | -1.99 | 1.99 | -0.42 | 1.205 | 0.002391 | | 30 | 1.11 | -2.65 | 2.64 | -1.11 | 1.8775 | 0.003725 | | 40 | 1.57 | -3.13 | 3.12 | -1.61 | 2.3575 | 0.004678 | | 50 | 1.82 | -3.34 | 3.35 | -1.82 | 2.5825 | 0.005124 | | 60 | 1.93 | -3.48 | 3.46 | -1.95 | 2.705 | 0.005367 | | 70 | 2 | -3.54 | 3.53 | -2.01 | 2.77 | 0.005496 | | 80 | 2.03 | -3.58 | 3.56 | -2.05 | 2.805 | 0.005565 | | 90 | 2.05 | -3.6 | 3.58 | -2.05 | 2.82 | 0.005595 | | 100 | 2.04 | -3.61 | 3.6 | -2.07 | 2.83 | 0.005615 | | 110 | 2.06 | -3.62 | 3.6 | -2.08 | 2.84 | 0.005635 | | 120 | 2.06 | -3.61 | 3.6 | -2.08 | 2.8375 | 0.00563 | | 130 | 2.05 | -3.6 | 3.59 | -2.08 | 2.83 | 0.005615 | | 140 | 2.04 | -3.6 | 3.58 | -2.07 | 2.8225 | 0.0056 | | 150 | 2.02 | -3.57 | 3.55 | -2.04 | 2.795 | 0.005546 | | 160 | 1.98 | -3.53 | 3.52 | -2.01 | 2.76 | 0.005476 | | 170 | 1.92 | -3.48 | 3.45 | -1.94 | 2.6975 | 0.005352 | | 180 | 1.8 | -3.36 | 3.34 | -1.8 | 2.575 | 0.005109 | | 190 | 1.55 | -3.12 | 3.1 | -1.56 | 2.3325 | 0.004628 | | 200 | 1.07 | -2.65 | 2.64 | -1.11 | 1.8675 | 0.003705 |   注意纪录线圈的霍尔灵敏度，单位 |
| 六、数据处理  ①实验仪双刀开关倒向“”，测试仪功能选择置于“”，然后调节，测绘曲线。   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  | | 1.00 | 2.4 | -2.67 | 2.65 | -2.41 | 2.53 | | 1.50 | 3.59 | -3.99 | 3.97 | -3.61 | 3.79 | | 2.00 | 4.79 | -5.32 | 5.3 | -4.81 | 5.06 | | 2.50 | 5.96 | -6.62 | 6.6 | -5.98 | 6.29 | | 3.00 | 7.17 | -7.96 | 7.94 | -7.19 | 7.57 | | 3.50 | 8.36 | -9.28 | 9.26 | -8.38 | 8.82 | | 4.00 | 9.56 | -10.6 | 10.59 | -9.58 | 10.08 |   ②保持的值不变()，测绘曲线   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  | | 0.300 | 4.16 | -4.89 | 4.87 | -4.12 | 4.51 | | 0.400 | 5.64 | -6.41 | 6.39 | -5.64 | 6.02 | | 0.500 | 7.14 | -7.95 | 7.93 | -7.18 | 7.55 | | 0.600 | 8.69 | -9.48 | 9.46 | -8.68 | 9.08 | | 0.700 | 10.2 | -11.01 | 10.99 | -10.24 | 10.61 | | 0.800 | 11.76 | -12.54 | 12.52 | -11.76 | 12.15 |     ，  由公式 和 得：  计算得：    ③测量螺线管轴线上磁场分布()   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | +B,+ | -B,+ | -B,- | +B,- |  |  | | 20 | 0.42 | -1.99 | 1.99 | -0.42 | 1.205 | 0.002391 | | 30 | 1.11 | -2.65 | 2.64 | -1.11 | 1.8775 | 0.003725 | | 40 | 1.57 | -3.13 | 3.12 | -1.61 | 2.3575 | 0.004678 | | 50 | 1.82 | -3.34 | 3.35 | -1.82 | 2.5825 | 0.005124 | | 60 | 1.93 | -3.48 | 3.46 | -1.95 | 2.705 | 0.005367 | | 70 | 2 | -3.54 | 3.53 | -2.01 | 2.77 | 0.005496 | | 80 | 2.03 | -3.58 | 3.56 | -2.05 | 2.805 | 0.005565 | | 90 | 2.05 | -3.6 | 3.58 | -2.05 | 2.82 | 0.005595 | | 100 | 2.04 | -3.61 | 3.6 | -2.07 | 2.83 | 0.005615 | | 110 | 2.06 | -3.62 | 3.6 | -2.08 | 2.84 | 0.005635 | | 120 | 2.06 | -3.61 | 3.6 | -2.08 | 2.8375 | 0.00563 | | 130 | 2.05 | -3.6 | 3.59 | -2.08 | 2.83 | 0.005615 | | 140 | 2.04 | -3.6 | 3.58 | -2.07 | 2.8225 | 0.0056 | | 150 | 2.02 | -3.57 | 3.55 | -2.04 | 2.795 | 0.005546 | | 160 | 1.98 | -3.53 | 3.52 | -2.01 | 2.76 | 0.005476 | | 170 | 1.92 | -3.48 | 3.45 | -1.94 | 2.6975 | 0.005352 | | 180 | 1.8 | -3.36 | 3.34 | -1.8 | 2.575 | 0.005109 | | 190 | 1.55 | -3.12 | 3.1 | -1.56 | 2.3325 | 0.004628 | | 200 | 1.07 | -2.65 | 2.64 | -1.11 | 1.8675 | 0.003705 | |
| 七、结果陈述：  本实验前两个表格用来计算RH，主要通过已知条件和图像斜率得到。第三个表格呈现出螺线管上磁场分布的曲线。 |
| 八、实验总结与思考题  此次实验可以分为两个部分，一个部分测量RH，可以得出KH；而第二个部分已知KH来得到B，画出磁场分布，通过对公式的掌握和理解不难得出。  思考题：  1.如果磁感应强度B不垂直于霍尔片，对测量结果有何影响？如何由实验判断B与霍尔片是否垂直？  如果磁场B不是垂直于霍尔元件片的，那么用测量的霍尔电压计算出来的磁感应强度的大小是磁场在垂直于霍尔元件片的方向上的分量，与原先想要求得的磁场强度不同。  2.霍尔效应有哪些应用？试举一例，简述其原理。  汽车的发动机转速表，当发动机转动时材料中的载流子在外加磁场中运动，受到洛伦兹力的作用而偏移，形成垂直于电流方向的电场，测量霍尔电压，通过相应的转化，可得转速。 |
| 指导教师批阅意见： |
| 成绩评定：     |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **预习**  （20分） | **操作及记录**  （40分） | 数据处理20分 | 结果陈述实验总结10分 | 思考题  10分 | **报告整体**  **印 象** | **总分** | |  |  |  |  |  |  |  | |