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| **五、数据处理**  （注:需从原始数据记录表整理数据到此栏，再进行数据处理）   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 环的级数 | m | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | | 环的位置 | 右侧(mm) | 22.665 | 22.764 | 22.855 | 22.957 | 23.050 | 23.147 | 23.230 | 23.322 | 23.404 | 23.510 | |  | 左侧(mm) | 31.844 | 31.755 | 31.655 | 31.553 | 31.452 | 31.342 | 31.225 | 31.121 | 31.000 | 30.872 | | 环的直径Dm | mm | 9.179 | 8.991 | 8.800 | 8.596 | 8.402 | 8.195 | 7.995 | 7.799 | 7.596 | 7.362 | | Dm^2 | mm^2 | 84.254 | 80.838 | 77.440 | 73.891 | 70.594 | 67.158 | 63.920 | 60.824 | 57.699 | 54.199 | | 环的级数 | m | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | | 环的位置 | 右侧(mm) | 23.642 | 23.775 | 23.909 | 24.050 | 24.187 | 24.332 | 24.505 | 24.677 | 24.858 | 25.047 | |  | 左侧(mm) | 30.755 | 30.642 | 30.500 | 30.379 | 30.204 | 30.051 | 29.893 | 29.732 | 29.542 | 29.340 | | 环的直径Dn | mm | 7.113 | 6.867 | 6.591 | 6.329 | 6.017 | 5.719 | 5.388 | 5.055 | 4.684 | 4.293 | | Dn^2 | mm^2 | 50.595 | 47.156 | 43.441 | 40.056 | 36.204 | 32.707 | 29.031 | 25.553 | 21.940 | 18.430 | | Dm^2-Dn^2 | mm^2 | 33.659 | 33.682 | 33.999 | 33.835 | 34.389 | 34.451 | 34.889 | 35.271 | 35.759 | 35.769 | | R | m | 14.279 | 14.289 | 14.423 | 14.354 | 14.589 | 14.615 | 14.801 | 14.963 | 15.170 | 15.174 | |
| **六、结果陈述**  平凸透镜的曲率半径：    本次实验利用干涉法测量平凸透镜的曲率半径，加深了我对光的波动性，尤其是对干涉现象的认识，同时还了解读数显微镜的使用方法，并掌握逐差法处理实验数据，培养和提高了我对误差分析和合理分配的能力。 |
| **七、思考题**  **1.分析本次牛顿环实验误差的可能来源。**  1)环有一定厚度，读数位置会产生误差.  2)显微镜测量读数分度值较大，直径测量存在误差  3)钠光灯的亮暗程度、显微镜观察对于暗环边缘有影响  4)牛顿环形状可能发生变化导致实验误差  **2.若测量某种透明液体光学介质的折射率，涉及具体的实验装置（放置牛顿环的装置，包含设计简图），及分析需要注意的事项。**  （1）实验装置设计：  a.光源：需要一个单色光源，比如钠灯或汞灯，以提供单一波长的光。  b.平面平行板：一个具有非常平整表面的平面玻璃板作为基底。  c.透镜：一个具有曲率的透镜，通常为凸透镜，用于聚焦光源并形成牛顿环。  d.透明液体样品：需要测量折射率的液体。  e.支架：用于固定透镜和平面平行板的支架。  f.观测装置：通常使用显微镜来观察牛顿环的干涉图样。  g.读数装置：用于测量牛顿环的直径或半径。  (2)实验简图：     1. 注意事项：   A.光源稳定性：确保光源稳定，避免光强波动影响测量结果。  B.透镜和平面板的清洁：在实验前清洁透镜和平面板，避免灰尘和污迹影响干涉图样的清晰度。  C.接触点：透镜和平面板之间的接触点应该是一个非常小的点，以形成牛顿环。  D.样品层厚度：确保液体样品层的厚度均匀一致，可以使用精确的滴管来控制液体的量。  E.环境因素：控制实验室的温度和湿度，因为它们可能会影响折射率的测量。  F.读数精度：使用高精度的读数设备来测量牛顿环的直径或半径。  G.数据处理：记录多个牛顿环的数据，并使用适当的公式来计算折射率，以提高测量的准确性和重复性。  H.干涉图样的识别：正确识别牛顿环的亮环和暗环，因为它们与光程差有关。  I.光学系统校准：在实验前校准光学系统，确保显微镜和读数装置的准确性。  J.安全措施：使用适当的安全措施，特别是当使用激光或其他强光源时。 |
| **指导教师批阅意见** |
| **成绩评定**     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 预习  （20分） | 操作及记录  （40分） | 数据处理与结果陈述（30分） | 思考题  （10分） | 报告整体  印 象 | 总分 | |  |  |  |  |  |  | |

注：正文统一用5号字，标题可大一号，图表名可小一号；

原始数据记录表需单独起页（表格自拟，作为预习报告评分的一部分），提交报告时附在最后；