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| **五、数据处理**  **1.位移法测凸透镜焦距:**   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | **物屏** | **透镜位置1** | **透镜位置2** | **像屏** | **D** | **d** | **f** | | 1 | 10.00 | 37.10 | 44.60 | 71.00 | 61.00 | 7.50 | 15.019 | | 2 | 10.00 | 36.60 | 46.50 | 72.00 | 62.00 | 9.90 | 15.105 | | 3 | 10.00 | 35.40 | 48.50 | 73.00 | 63.00 | 13.10 | 15.069 | | 4 | 10.00 | 34.80 | 50.00 | 74.00 | 64.00 | 15.20 | 15.097 | | 5 | 10.00 | 34.10 | 51.30 | 75.00 | 65.00 | 17.20 | 15.112 | | 6 | 10.00 | 33.90 | 52.60 | 76.00 | 66.00 | 18.70 | 15.175 |   **2.自组望远镜并测量凹透镜焦距:**   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **L1与目镜距离** | **实像位置a** | **L2位置b** | **L2焦距（a-b）** | | 1 | 15.00 | 49.70 | 45.20 | 4.50 | | 2 | 15.00 | 50.35 | 45.40 | 4.95 | | 3 | 15.00 | 51.60 | 47.05 | 4.55 | | 4 | 15.00 | 53.10 | 48.40 | 4.70 | | 5 | 15.00 | 55.25 | 50.50 | 4.75 | | 6 | 15.00 | 57.50 | 52.95 | 4.55 | |
| **六、结果陈述**  **1.位移法测凸透镜焦距:**  (1)利用公式计算凸透镜焦距f：      (2)计算凸透镜焦距f平均值：  = (15.019+15.105+15.069+15.097+15.112+15.175)÷6 = 15.097cm  (3)计算凸透镜焦距f百分比误差：  平均误差 =  = (0.078+0.008+0.028+0+0.015+0.078)÷6×100% = 3.45%  **2.自组望远镜并测量凹透镜焦距:**  (1)计算凹透镜焦距f平均值：     1. 计算凹透镜焦距f百分比误差：   **由实验数据得出：**  1.凸透镜焦距f1=15.097cm×（1±3.45%）  2.凸透镜焦距f2=4.959cm×（1±5.83%）  3.凸透镜可以实物成实像，凸透镜靠近像屏时成缩小像，靠近物体时成放大像，而凹透镜可以实物成虚像，故必须借助凸透镜才能成实像。  4.当光源与凸透镜距离一倍焦距时，可以组平行光；目镜和凸透镜可以组成望远镜，聚焦于无穷远。 |
| **七、思考题**  **1，利用位移法测凸透镜焦距有什么优点？**  用位移法测量焦距的时候是利用了成放大像和缩小像是两凸透镜的相对位移来计算得焦距的，避免了用薄透镜成像公式中测物距和像距带来的误差。  **2，共轴调节的具体方法。**   1. 粗调：先将光源、物屏、透镜靠拢，用眼睛观察，调节各元件的高低及左右，使得光源、物屏的中心和透镜的中心大致在一条和导轨平行的直线上，且透镜、物屏的平面要与导轨方向垂。 2. 细调：利用透镜成像规律判断是否共轴，并进一步调至共轴，小像中往哪边偏，透镜就往哪边移。反复观察大小像，直至中心重合。 |
| **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 | |  |  |  |  |  |  | |