# Lab 6

## Data Tables

DATA TABLE 1-1 (*purpose*: to measure the wavelength of He-Ne laser)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *N* | 0 | 50 | 100 | 150 | 200 | 250 |
| *d* (mm) |  |  |  |  |  |  |
| *Δd* (mm) | *Δd1*= *=* | | *Δd2*= *=* | | *Δd3*=*=* | |
|  |  | | | | | |
| (nm) |  | | | | | |

DATA TABLE 1-2 (*purpose*: to measure the index of refraction of air)

Room temperature *T*= ℃; Atmospheric pressure *p*=1.01325×105 Pa;

*L*=95.0 mm; *λ*0=633.0 nm; *m*=60.

|  |  |  |  |
| --- | --- | --- | --- |
| Trial | 1 | 2 | 3 |
| *p*1 (MPa) |  |  |  |
| *p*2 (MPa) |  |  |  |
| *Δp*= (MPa) |  |  |  |
| (MPa) |  | | |
|  |  | | |

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# Lab 7

## Data Tables

DATA TABLE 2-1 (*purpose*: to measure the apex angle of a prism)

Instrument error:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position of telescope | Left side (position 1) | | Right side (position 2) | |
| Trial | Vernier 1 | Vernier 2 | Vernier 1 | Vernier 2 |
| *θ*1 (°, ') | *θ*1'(°, ') | *θ*2(°, ') | *θ*2'(°, ') |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| Averaged |  |  |  |  |

DATA TABLE 2-2 (*purpose*: to measure the wavelengths of lines in the spectra of mercury)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Diffraction order | *k*=-1(left side) | | | | | | *k*=+1(right side) | | | | | |
| Lines | Yellow 2 | | Yellow 1 | | Green | | Green | | Yellow 1 | | Yellow 2 | |
| Trial | *φ*Y-L21 | *φ*Y-L22 | *φ*Y-L11 | *φ*Y-L12 | *φ*G-L1 | *φ*G-L2 | *φ*G-R1 | *φ*G-R2 | *φ*Y-R11 | *φ*Y-R12 | *φ*Y-R21 | *φ*Y-R22 |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| Averaged |  |  |  |  |  |  |  |  |  |  |  |  |

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# Lab 8

## Data Tables

DATA TABLE 3-1 (Measured by manual mode. *purpose*: to determine the first excitation potential of argon atom)

*V*1*= 2.2* ; *V*2*= 2.0* ; *V*3*= 8.0* ;

(The unit of the current in the following table is )

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 1 | 4 | 9 | 15 | 23 | 32 | 40 | 46 |
| 20 | 49 | 49 | 48 | 50 | 64 | 95 | 138 | 187 | 231 | 262 |
| 30 | 270 | 252 | 215 | 173 | 140 | 137 | 198 | 326 | 486 | 636 |
| 40 | 746 | 794 | 770 | 674 | 535 | 396 | 302 | 302 | 461 | 757 |
| 50 | 1093 | 1384 | 1579 | 1651 | 1590 | 1409 | 1150 | 885 | 685 | 645 |
| 60 | 840 | 1211 | 1642 | 2029 | 2313 | 2455 | 2438 | 2272 | 1993 | 1667 |
| 70 | 1376 | 1235 | 1323 | 1614 | 2014 | 2433 | 2798 | 3054 | 3169 | 3132 |

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DATA TABLE 3-2 (Measured by computer. *purpose*: to determine the first excitation potential of argon atom)

*V*1*= 2.0* ; *V*2*= 2* ; *V*3*= 8* ;

(The unit of the current in the following table is )

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 7 | 10 | 12 |
| 20 | 13 | 13 | 13 | 12 | 14 | 21 | 33 | 48 | 63 | 74 |
| 30 | 78 | 75 | 64 | 51 | 40 | 35 | 45 | 75 | 118 | 163 |
| 40 | 198 | 214 | 210 | 185 | 147 | 108 | 79 | 71 | 100 | 167 |
| 50 | 298 | 337 | 396 | 421 | 411 | 367 | 301 | 232 | 178 | 158 |
| 60 | 197 | 292 | 416 | 536 | 629 | 680 | 684 | 642 | 566 | 475 |
| 70 | 391 | 345 | 364 | 448 | 573 | 709 | 830 | 916 | 956 | 947 |

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DATA TABLE 3-3 (Measured by computer. *purpose*: to determine the first excitation potential of argon atom)

*V*1*=* ; *V*2*=* ; *V*3*=* ;

(The unit of the current in the following table is )

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 |
| 0 |  |  |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |
| 30 |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |
| 50 |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |
| 70 |  |  |  |  |  |  |  |  |  |  |

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# Lab 9

## DATA TABLE 4-1 (*purpose*: to measure the electric charges carried by an oil droplet)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Oil droplets | Balance voltage  *V*(v) | | Fall time  *t*(s) | |
| Measurement | Averaged | Measurement | Averaged |
| 1 |  |  |  |  |
|  |  |
|  |  |
| 2 |  |  |  |  |
|  |  |
|  |  |
| 3 |  |  |  |  |
|  |  |
|  |  |
| 4 |  |  |  |  |
|  |  |
|  |  |
| 5 |  |  |  |  |
|  |  |
|  |  |
| 6 |  |  |  |  |
|  |  |
|  |  |
| 7 |  |  |  |  |
|  |  |
|  |  |
| 8 |  |  |  |  |
|  |  |
|  |  |
| 9 |  |  |  |  |
|  |  |
|  |  |
| 10 |  |  |  |  |
|  |  |
|  |  |

Instructor’s Initial:

# Lab 10

## Data Tables

DATA TABLE 7-1 (*purpose*: to measure the stopping potentials for different lights)

|  |  |  |
| --- | --- | --- |
| Wavelength  (nm) | Frequency  (Hz) | Stopping potential  (V) |
| 365 |  |  |
| 405 |  |  |
| 436 |  |  |
| 546 |  |  |
| 577 |  |  |

DATA TABLE 7-2 (*purpose*: to measure current-voltage characteristics of the photoelectric tube)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *ΔV* */* V | -2.0 | 0.0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 |
| *d*=30cm, *I* */* 10-11A |  |  |  |  |  |  |  |  |
| *d*=40cm, *I* */* 10-11A |  |  |  |  |  |  |  |  |
| *ΔV* */* V | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 | 28.0 | 30.0 |
| *d*=30cm, *I* */* 10-11A |  |  |  |  |  |  |  |  | |
| *d*=40cm, *I* */* 10-11A |  |  |  |  |  |  |  |  | |
| *ΔV* */* V | 32.0 | 34.0 | 36.0 | 38.0 | 40.0 | 43.0 | 46.0 | 50.0 | |
| *d*=30cm, *I* */* 10-11A |  |  |  |  |  |  |  |  | |
| *d*=40cm, *I* */* 10-11A |  |  |  |  |  |  |  |  | |

Instructor’s Initial:

# Lab 11

## Data Tables

DATA TABLE 8-1 (*purpose*: to measure the emf produced by a thermocouple)

Room temperature Multiple of the potentiometer

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Temperature, *T* (℃) | 35 | 45 | 55 | 65 | 75 | 85 |
| Thermal emf,  *E*x (mV) |  |  |  |  |  |  |

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