## Lampiran 1

Data Panjang Gelombang dengan Tegangan Keluaran Cahaya pada Karbondioksida

| $\lambda$ (Å) | 3.8 kV | 3.6 kV | 3.4 kV | 3.2 kV |
|---|---|---|---|---|
| | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** |
| 7119 | 0,3 | 0,3 | 0,3 | 0,3 |
| 7116 | 0,4 | 0,4 | 0,3 | 0,3 |
| 7115 | 0,3 | 0,4 | 0,3 | 0,3 |
| 7115.19 | 0,3 | 0,3 | 0,3 | 0,3 |
| 7113 | 0,3 | 0,3 | 0,3 | 0,3 |
| 6783 | 0,4 | 0,4 | 0,3 | 0,3 |
| 6587 | 17 | 16 | 14 | 14 |
| 6582 | 18 | 14 | 14 | 11 |
| 6578 | 16 | 14 | 18 | 13 |
| 6014 | 0,3 | 0,4 | 0,7 | 0,3 |
| 6013 | 0,3 | 0,4 | 0,6 | 0,3 |
| 6010 | 0,4 | 0,5 | 0,4 | 0,3 |
| 6007 | 0,3 | 0,3 | 0,7 | 0,3 |
| 6006 | 0,3 | 0,4 | 0,8 | 0,3 |
| 6001 | 0,3 | 0,4 | 0,7 | 0,3 |
| 5891 | 0,8 | 0,8 | 0,8 | 0,7 |
| 5889 | 0,8 | 0,6 | 18 | 0,6 |
| 5662 | 46 | 48 | 36 | 34 |
| 5648 | 48 | 46 | 40 | 44 |
| 5380 | 0,4 | 0,4 | 0,3 | 0,3 |
| 5151 | 13 | 12 | 0,3 | 0,9 |
| 5145 | 0,8 | 11 | 10 | 10 |
| 5143 | 12 | 0,9 | 0,5 | 11 |
| 5133 | 0,8 | 0,6 | 0,8 | 0,6 |
| 5132 | 0,5 | 0,5 | 0,7 | 0,4 |
| 5052 | 0,4 | 0,4 | 0,4 | 0,4 |
| 4932 | 0,5 | 0,5 | 0,5 | 0,5 |
| 4771 | 14 | 11 | 11 | 11 |
| 4267.2 | 0,7 | 0,7 | 0,9 | 0,6 |
| 4267.0 | 0,5 | 0,5 | 0,9 | 0,5 |
| 4075 | 18 | 18 | 16 | 14 |
| 4074 | 13 | 12 | 12 | 11 |
| 3920 | 0,7 | 0,7 | 0,7 | 0,6 |
| 3918 | 0,7 | 0,4 | 0,4 | 0,5 |

## Lampiran 2

Data Tegangan Keluaran Cahaya Udara dengan Daya Total Cahaya pada Karbondioksida

| 3,8 kV | | 3,6 kV | | 3,4 kV | | 3,2 kV | |
|---|---|---|---|---|---|---|---|
| *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) |
| 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 0,4 | 0,727273 | 0,4 | 0,727273 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,4 | 0,727273 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 0,4 | 0,727273 | 0,4 | 0,727273 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 17 | 30,90909 | 16 | 29,09091 | 14 | 25,45455 | 14 | 25,45455 |
| 18 | 32,72727 | 14 | 25,45455 | 14 | 25,45455 | 11 | 20 |
| 16 | 29,09091 | 14 | 25,45455 | 18 | 32,72727 | 13 | 23,63636 |
| 0,3 | 0,545455 | 0,4 | 0,727273 | 0,7 | 1,272727 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,4 | 0,727273 | 0,6 | 1,090909 | 0,3 | 0,545455 |
| 0,4 | 0,727273 | 0,5 | 0,909091 | 0,4 | 0,727273 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,3 | 0,545455 | 0,7 | 1,272727 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,4 | 0,727273 | 0,8 | 1,454545 | 0,3 | 0,545455 |
| 0,3 | 0,545455 | 0,4 | 0,727273 | 0,7 | 1,272727 | 0,3 | 0,545455 |
| 0,8 | 1,454545 | 0,8 | 1,454545 | 0,8 | 1,454545 | 0,7 | 1,272727 |
| 0,8 | 1,454545 | 0,6 | 1,090909 | 18 | 32,72727 | 0,6 | 1,090909 |
| 46 | 83,63636 | 48 | 87,27273 | 36 | 65,45455 | 34 | 61,81818 |
| 48 | 87,27273 | 46 | 83,63636 | 40 | 72,72727 | 44 | 80 |
| 0,4 | 0,727273 | 0,4 | 0,727273 | 0,3 | 0,545455 | 0,3 | 0,545455 |
| 13 | 23,63636 | 12 | 21,81818 | 0,3 | 0,545455 | 0,9 | 1,636364 |
| 0,8 | 1,454545 | 11 | 20 | 10 | 18,18182 | 10 | 18,18182 |
| 12 | 21,81818 | 0,9 | 1,636364 | 0,5 | 0,909091 | 11 | 20 |
| 0,8 | 1,454545 | 0,6 | 1,090909 | 0,8 | 1,454545 | 0,6 | 1,090909 |
| 0,5 | 0,909091 | 0,5 | 0,909091 | 0,7 | 1,272727 | 0,4 | 0,727273 |
| 0,4 | 0,727273 | 0,4 | 0,727273 | 0,4 | 0,727273 | 0,4 | 0,727273 |
| 0,5 | 0,909091 | 0,5 | 0,909091 | 0,5 | 0,909091 | 0,5 | 0,909091 |
| 14 | 25,45455 | 11 | 20 | 11 | 20 | 11 | 20 |
| 0,7 | 1,272727 | 0,7 | 1,272727 | 0,9 | 1,636364 | 0,6 | 1,090909 |
| 0,5 | 0,909091 | 0,5 | 0,909091 | 0,9 | 1,636364 | 0,5 | 0,909091 |
| 18 | 32,72727 | 18 | 32,72727 | 16 | 29,09091 | 14 | 25,45455 |
| 13 | 23,63636 | 12 | 21,81818 | 12 | 21,81818 | 11 | 20 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0,7 | 1,272727 | 0,7 | 1,272727 | 0,7 | 1,272727 | 0,6 | 1,090909 |
| 0,7 | 1,272727 | 0,4 | 0,727273 | 0,4 | 0,727273 | 0,5 | 0,909091 |

Keterangan:
$V_i$ = Tegangan keluaran cahaya (mV)
$P_i$ = Daya total cahaya (x $10^{-9}$ W)

## Lampiran 3

Data Panjang Gelombang dengan Tegangan Keluaran Cahaya pada Nitrogen

| $\lambda$ (Å) | 3.8 kV | 3.6 kV | 3.4 kV | 3.2 kV |
|---|---|---|---|---|
| | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** |
| 5016.39 | 16 | 16 | 16 | 13 |
| 5025.66 | 16 | 17 | 11 | 11 |
| 5045.10 | 0.6 | 0.6 | 0.5 | 0.4 |
| 5281.20 | 0.4 | 0.4 | 0.4 | 0.4 |
| 5292.68 | 0.6 | 0.5 | 0.4 | 0.4 |
| 5495.67 | 0.4 | 0.4 | 0.4 | 0.4 |
| 5535.36 | 0.5 | 0.4 | 0.4 | 0.4 |
| 5666.63 | 48 | 48 | 42 | 42 |
| 5676.02 | 36 | 42 | 32 | 34 |
| 5679.56 | 38 | 36 | 34 | 32 |
| 5686.21 | 34 | 28 | 13 | 13 |
| 5710.77 | 0.9 | 0.9 | 0.9 | 0.8 |
| 5747.30 | 0.4 | 0.4 | 0.3 | 0.2 |
| 5752.50 | 0.1 | 0.3 | 0.4 | 0.4 |
| 5764.75 | 0.3 | 0.3 | 0.2 | 0.2 |
| 5829.54 | 0.3 | 0.3 | 0.3 | 0.3 |
| 5854.04 | 0.2 | 0.2 | 0.1 | 0.2 |
| 5927.81 | 26 | 23 | 26 | 24 |
| 5931.78 | 12 | 19 | 19 | 16 |
| 5940.24 | 14 | 13 | 12 | 11 |
| 5941.65 | 14 | 12 | 11 | 10 |
| 5952.39 | 0.7 | 0.4 | 0.4 | 0.4 |
| 5999.43 | 0.6 | 0.4 | 0.4 | 0.3 |
| 6008.41 | 0.6 | 0.3 | 0.3 | 0.3 |
| 6167.76 | 0.6 | 0.8 | 0.8 | 0.7 |
| 6379.62 | 0.2 | 0.5 | 0.4 | 0.4 |
| 6411.65 | 0.4 | 0.4 | 0.4 | 0.4 |
| 6420.64 | 0.4 | 0.6 | 0.7 | 0.5 |
| 6423.02 | 0.2 | 0.8 | 0.7 | 0.5 |
| 6428.32 | 0.2 | 0.8 | 0.8 | 0.6 |
| 6437.68 | 0.3 | 0.8 | 10 | 0.7 |
| 6440.94 | 12 | 12 | 12 | 0.9 |
| 6457.90 | 22 | 21 | 19 | 17 |
| 6468.44 | 24 | 19 | 19 | 14 |

| | | | | |
|---|---|---|---|---|
| 6482.05 | 24 | 14 | 14 | 11 |
| 6482.70 | 23 | 14 | 14 | 11 |
| 6483.75 | 24 | 13 | 13 | 10 |
| 6481.71 | 22 | 14 | 14 | 11 |
| 6484.80 | 22 | 13 | 13 | 10 |
| 6491.22 | 16 | 0.9 | 0.9 | 0.7 |
| 6499.54 | 0.6 | 0.9 | 0.9 | 10 |
| 6506.31 | 11 | 11 | 10 | 0.9 |
| 6610.56 | 16 | 16 | 13 | 0.8 |
| 6622.54 | 11 | 11 | 0.7 | 0.7 |
| 6636.94 | 0.7 | 0.7 | 0.7 | 0.5 |
| 6644.96 | 0.4 | 0.4 | 0.4 | 0.4 |
| 6646.50 | 0.7 | 0.6 | 0.4 | 0.5 |
| 6653.56 | 0.4 | 0.4 | 0.4 | 0.4 |
| 6656.51 | 0.7 | 0.5 | 0.5 | 0.3 |
| 6722.62 | 0.5 | 0.5 | 0.5 | 0.3 |

## Lampiran 4

Data Tegangan Keluaran Cahaya Udara dengan Daya Total Cahaya pada Nitrogen

| 3,8 kV | | 3,6 kV | | 3,4 kV | | 3,2 kV | |
|---|---|---|---|---|---|---|---|
| *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) |
| 16 | 29.09091 | 16 | 29.0909 | 16 | 29.0909 | 13 | 23.6363 |
| 16 | 29.09091 | 17 | 30.9090 | 11 | 20 | 11 | 20 |
| 0.6 | 1.090909 | 0.6 | 1.09090 | 0.5 | 0.90909 | 0.4 | 0.72727 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.6 | 1.090909 | 0.5 | 0.90909 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.5 | 0.909091 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 48 | 87.27273 | 48 | 87.2727 | 42 | 76.3636 | 42 | 76.3636 |
| 36 | 65.45455 | 42 | 76.3636 | 32 | 58.1818 | 34 | 61.8181 |
| 38 | 69.09091 | 36 | 65.4545 | 34 | 61.8181 | 32 | 58.1818 |
| 34 | 61.81818 | 28 | 50.9090 | 13 | 23.6363 | 13 | 23.6363 |
| 0.9 | 1.636364 | 0.9 | 1.63636 | 0.9 | 1.63636 | 0.8 | 1.45454 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.3 | 0.54545 | 0.2 | 0.36363 |
| 0.1 | 0.181818 | 0.3 | 0.54545 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.3 | 0.545455 | 0.3 | 0.54545 | 0.2 | 0.36363 | 0.2 | 0.36363 |
| 0.3 | 0.545455 | 0.3 | 0.54545 | 0.3 | 0.54545 | 0.3 | 0.54545 |
| 0.2 | 0.363636 | 0.2 | 0.36363 | 0.1 | 0.18181 | 0.2 | 0.36363 |
| 26 | 47.27273 | 23 | 41.8181 | 26 | 47.2727 | 24 | 43.6363 |
| 12 | 21.81818 | 19 | 34.5454 | 19 | 34.5454 | 16 | 29.0909 |
| 14 | 25.45455 | 13 | 23.6363 | 12 | 21.8181 | 11 | 20 |
| 14 | 25.45455 | 12 | 21.8181 | 11 | 20 | 10 | 18.1818 |
| 0.7 | 1.272727 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.6 | 1.090909 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.3 | 0.54545 |
| 0.6 | 1.090909 | 0.3 | 0.54545 | 0.3 | 0.54545 | 0.3 | 0.54545 |
| 0.6 | 1.090909 | 0.8 | 1.45454 | 0.8 | 1.45454 | 0.7 | 1.27272 |
| 0.2 | 0.363636 | 0.5 | 0.90909 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.4 | 0.727273 | 0.6 | 1.09090 | 0.7 | 1.27272 | 0.5 | 0.90909 |
| 0.2 | 0.363636 | 0.8 | 1.45454 | 0.7 | 1.27272 | 0.5 | 0.90909 |
| 0.2 | 0.363636 | 0.8 | 1.45454 | 0.8 | 1.45454 | 0.6 | 1.09090 |
| 0.3 | 0.545455 | 0.8 | 1.45454 | 10 | 18.1818 | 0.7 | 1.27272 |
| 12 | 21.81818 | 12 | 21.8181 | 12 | 21.8181 | 0.9 | 1.63636 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22 | 40 | 21 | 38.1818 | 19 | 34.5454 | 17 | 30.9090 |
| 24 | 43.63636 | 19 | 34.5454 | 19 | 34.5454 | 14 | 25.4545 |
| 24 | 43.63636 | 14 | 25.4545 | 14 | 25.4545 | 11 | 20 |
| 23 | 41.81818 | 14 | 25.4545 | 14 | 25.4545 | 11 | 20 |
| 24 | 43.63636 | 13 | 23.6363 | 13 | 23.6363 | 10 | 18.1818 |
| 22 | 40 | 14 | 25.4545 | 14 | 25.4545 | 11 | 20 |
| 22 | 40 | 13 | 23.6363 | 13 | 23.6363 | 10 | 18.1818 |
| 16 | 29.09091 | 0.9 | 1.63636 | 0.9 | 1.63636 | 0.7 | 1.27272 |
| 0.6 | 1.090909 | 0.9 | 1.63636 | 0.9 | 1.63636 | 10 | 18.1818 |
| 11 | 20 | 11 | 20 | 10 | 18.1818 | 0.9 | 1.63636 |
| 16 | 29.09091 | 16 | 29.0909 | 13 | 23.6363 | 0.8 | 1.45454 |
| 11 | 20 | 11 | 20 | 0.7 | 1.27272 | 0.7 | 1.27272 |
| 0.7 | 1.272727 | 0.7 | 1.27272 | 0.7 | 1.27272 | 0.5 | 0.90909 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.7 | 1.272727 | 0.6 | 1.09090 | 0.4 | 0.72727 | 0.5 | 0.90909 |
| 0.4 | 0.727273 | 0.4 | 0.72727 | 0.4 | 0.72727 | 0.4 | 0.72727 |
| 0.7 | 1.272727 | 0.5 | 0.90909 | 0.5 | 0.90909 | 0.3 | 0.54545 |
| 0.5 | 0.909091 | 0.5 | 0.90909 | 0.5 | 0.90909 | 0.3 | 0.54545 |

Keterangan:
$V_i$ = Tegangan keluaran cahaya (mV)
$P_i$ = Daya total cahaya (x $10^{-9}$ W)

## Lampiran 5

Data Panjang Gelombang dengan Tegangan Keluaran Cahaya pada Hidrogen

| $\lambda$ (Å) | 3.8 kV | 3.6 kV | 3.4 kV | 3.2 kV |
|---|---|---|---|---|
| | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** |
| 4101 | 10 | 0.8 | 0.7 | 0.4 |
| 4340 | 12 | 13 | 0.9 | 0.5 |
| 4861 | 12 | 12 | 0.8 | 0.9 |
| 6562.7 | 48 | 44 | 44 | 32 |
| 6562.8 | 52 | 44 | 40 | 32 |
| 3970 | 13 | 0.8 | 0.8 | 0.8 |

## Lampiran 6

Data Tegangan Keluaran Cahaya Udara dengan Daya Total Cahaya pada Hidrogen

| 3,8 kV | | 3,6 kV | | 3,4 kV | | 3,2 kV | |
|---|---|---|---|---|---|---|---|
| *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) |
| 10 | 18.18182 | 0.8 | 1.454545 | 0.7 | 1.272727 | 0.4 | 0.727273 |
| 12 | 21.81818 | 13 | 23.63636 | 0.9 | 1.636364 | 0.5 | 0.909091 |
| 12 | 21.81818 | 12 | 21.81818 | 0.8 | 1.454545 | 0.9 | 1.636364 |
| 48 | 87.27273 | 44 | 80 | 44 | 80 | 32 | 58.18182 |
| 52 | 94.54545 | 44 | 80 | 40 | 72.72727 | 32 | 58.18182 |
| 13 | 23.63636 | 0.8 | 1.454545 | 0.8 | 1.454545 | 0.8 | 1.454545 |

Keterangan:
$V_i$ = Tegangan keluaran cahaya (mV)
$P_i$ = Daya total cahaya (x $10^{-9}$ W)

## Lampiran 7

Data Panjang Gelombang dengan Tegangan Keluaran Cahaya pada Oksigen

| $\lambda$ (Å) | 3.8 kV | 3.6 kV | 3.4 kV | 3.2 kV |
|---|---|---|---|---|
| | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** | ***Vi*** **(mV)** |
| 7156 | 0.3 | 0.3 | 0.3 | 0.3 |
| 7002 | 0.4 | 0.4 | 0.4 | 0.4 |
| 7001 | 0.4 | 0.4 | 0.3 | 0.3 |
| 6653 | 0.3 | 0.2 | 0.2 | 0.1 |
| 6604 | 12 | 12 | 0.9 | 0.9 |
| 6455 | 19 | 19 | 16 | 14 |
| 6454 | 18 | 14 | 13 | 13 |
| 6453 | 18 | 14 | 13 | 12 |
| 6374 | 0.4 | 0.3 | 0.3 | 0.3 |
| 6366 | 0.3 | 0.3 | 0.2 | 0.2 |
| 6261 | 0.3 | 0.2 | 0.2 | 0.2 |
| 6256 | 0.3 | 0.4 | 0.3 | 0.3 |
| 6155 | 0.4 | 0.6 | 0.7 | 0.9 |
| 6106 | 0.7 | 0.3 | 0.3 | 0.2 |
| 6046.49 | 0.3 | 0.2 | 0.2 | 0.2 |
| 6046.23 | 0.3 | 0.3 | 0.2 | 0.3 |
| 5995 | 0.3 | 0.3 | 0.2 | 0.3 |
| 5958.58 | 0.3 | 0.2 | 0.2 | 0.2 |
| 6958.39 | 0.3 | 0.2 | 0.2 | 0.2 |
| 6577 | 0.6 | 0.4 | 0.3 | 0.3 |
| 5436 | 0.5 | 0.4 | 0.3 | 0.3 |
| 5435 | 0.4 | 0.5 | 0.3 | 0.2 |
| 5435.18 | 0.5 | 0.5 | 0.3 | 0.2 |
| 5330 | 0.4 | 0.4 | 0.3 | 0.3 |
| 5329.68 | 0.3 | 0.3 | 0.3 | 0.4 |
| 5329.10 | 0.4 | 0.3 | 0.3 | 0.4 |
| 4943 | 0.4 | 0.3 | 0.3 | 0.3 |
| 4924 | 0.4 | 0.3 | 0.3 | 0.3 |
| 4705 | 0.6 | 0.5 | 0.3 | 0.3 |
| 4699 | 0.8 | 0.7 | 0.4 | 0.5 |
| 4676 | 11 | 11 | 11 | 0.9 |
| 4661 | 13 | 13 | 13 | 0.9 |
| 4650 | 13 | 16 | 16 | 11 |
| 4649 | 19 | 22 | 22 | 12 |
| 4641 | 28 | 26 | 18 | 14 |

| | | | | |
|---|---|---|---|---|
| 4638 | 34 | 28 | 28 | 18 |
| 4609 | 38 | 48 | 36 | 32 |
| 4596 | 32 | 32 | 28 | 23 |
| 4590 | 24 | 23 | 26 | 18 |
| 4469 | 12 | 0.4 | 0.6 | 0.9 |
| 4467 | 11 | 0.9 | 0.9 | 0.6 |
| 4466 | 13 | 0.9 | 0.7 | 0.4 |
| 4465 | 12 | 12 | 0.9 | 12 |
| 4452 | 17 | 11 | 0.7 | 14 |
| 4448 | 11 | 0.9 | 0.6 | 11 |
| 4416 | 22 | 18 | 18 | 16 |
| 4414 | 19 | 17 | 18 | 16 |
| 4395 | 13 | 13 | 13 | 13 |
| 4368 | 0.5 | 0.6 | 0.4 | 0.4 |
| 4366 | 0.8 | 0.7 | 0.6 | 0.3 |
| 4349 | 0.9 | 0.8 | 0.7 | 0.8 |
| 4345 | 0.8 | 0.8 | 0.6 | 0.7 |
| 4336 | 9 | 11 | 11 | 0.8 |

## Lampiran 8

Data Tegangan Keluaran Cahaya Udara dengan Daya Total Cahaya pada Oksigen

| 3,8 kV | | 3,6 kV | | 3,4 kV | | 3,2 kV | |
|---|---|---|---|---|---|---|---|
| *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) | *Vi* | *Pi* (W) |
| 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.4 | 0.727273 | 0.4 | 0.727273 | 0.4 | 0.727273 | 0.4 | 0.727273 |
| 0.4 | 0.727273 | 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 | 0.1 | 0.181818 |
| 12 | 21.81818 | 12 | 21.81818 | 0.9 | 1.636364 | 0.9 | 1.636364 |
| 19 | 34.54545 | 19 | 34.54545 | 16 | 29.09091 | 14 | 25.45455 |
| 18 | 32.72727 | 14 | 25.45455 | 13 | 23.63636 | 13 | 23.63636 |
| 18 | 32.72727 | 14 | 25.45455 | 13 | 23.63636 | 12 | 21.81818 |
| 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.3 | 0.545455 | 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 |
| 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 | 0.2 | 0.363636 |
| 0.3 | 0.545455 | 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.4 | 0.727273 | 0.6 | 1.090909 | 0.7 | 1.272727 | 0.9 | 1.636364 |
| 0.7 | 1.272727 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.2 | 0.363636 |
| 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 | 0.2 | 0.363636 |
| 0.3 | 0.545455 | 0.3 | 0.545455 | 0.2 | 0.363636 | 0.3 | 0.545455 |
| 0.3 | 0.545455 | 0.3 | 0.545455 | 0.2 | 0.363636 | 0.3 | 0.545455 |
| 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 | 0.2 | 0.363636 |
| 0.3 | 0.545455 | 0.2 | 0.363636 | 0.2 | 0.363636 | 0.2 | 0.363636 |
| 0.6 | 1.090909 | 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.5 | 0.909091 | 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.4 | 0.727273 | 0.5 | 0.909091 | 0.3 | 0.545455 | 0.2 | 0.363636 |
| 0.5 | 0.909091 | 0.5 | 0.909091 | 0.3 | 0.545455 | 0.2 | 0.363636 |
| 0.4 | 0.727273 | 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.4 | 0.727273 |
| 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.4 | 0.727273 |
| 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.4 | 0.727273 | 0.3 | 0.545455 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.6 | 1.090909 | 0.5 | 0.909091 | 0.3 | 0.545455 | 0.3 | 0.545455 |
| 0.8 | 1.454545 | 0.7 | 1.272727 | 0.4 | 0.727273 | 0.5 | 0.909091 |
| 11 | 20 | 11 | 20 | 11 | 20 | 0.9 | 1.636364 |
| 13 | 23.63636 | 13 | 23.63636 | 13 | 23.63636 | 0.9 | 1.636364 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 13 | 23.63636 | 16 | 29.09091 | 16 | 29.09091 | 11 | 20 |
| 19 | 34.54545 | 22 | 40 | 22 | 40 | 12 | 21.81818 |
| 28 | 50.90909 | 26 | 47.27273 | 18 | 32.72727 | 14 | 25.45455 |
| 34 | 61.81818 | 28 | 50.90909 | 28 | 50.90909 | 18 | 32.72727 |
| 38 | 69.09091 | 48 | 87.27273 | 36 | 65.45455 | 32 | 58.18182 |
| 32 | 58.18182 | 32 | 58.18182 | 28 | 50.90909 | 23 | 41.81818 |
| 24 | 43.63636 | 23 | 41.81818 | 26 | 47.27273 | 18 | 32.72727 |
| 12 | 21.81818 | 0.4 | 0.727273 | 0.6 | 1.090909 | 0.9 | 1.636364 |
| 11 | 20 | 0.9 | 1.636364 | 0.9 | 1.636364 | 0.6 | 1.090909 |
| 13 | 23.63636 | 0.9 | 1.636364 | 0.7 | 1.272727 | 0.4 | 0.727273 |
| 12 | 21.81818 | 12 | 21.81818 | 0.9 | 1.636364 | 12 | 21.81818 |
| 17 | 30.90909 | 11 | 20 | 0.7 | 1.272727 | 14 | 25.45455 |
| 11 | 20 | 0.9 | 1.636364 | 0.6 | 1.090909 | 11 | 20 |
| 22 | 40 | 18 | 32.72727 | 18 | 32.72727 | 16 | 29.09091 |
| 19 | 34.54545 | 17 | 30.90909 | 18 | 32.72727 | 16 | 29.09091 |
| 13 | 23.63636 | 13 | 23.63636 | 13 | 23.63636 | 13 | 23.63636 |
| 0.5 | 0.909091 | 0.6 | 1.090909 | 0.4 | 0.727273 | 0.4 | 0.727273 |
| 0.8 | 1.454545 | 0.7 | 1.272727 | 0.6 | 1.090909 | 0.3 | 0.545455 |
| 0.9 | 1.636364 | 0.8 | 1.454545 | 0.7 | 1.272727 | 0.8 | 1.454545 |
| 0.8 | 1.454545 | 0.8 | 1.454545 | 0.6 | 1.090909 | 0.7 | 1.272727 |
| 9 | 16.36364 | 11 | 20 | 11 | 20 | 0.8 | 1.454545 |

Keterangan:
$V_i$ = Tegangan keluaran cahaya (mV)
$P_i$ = Daya total cahaya (x $10^{-9}$ W)

## Lampiran 9

Data File Garis Emisi pada Komponen Gas di Udara

| **Most common elements in solar spectrum.** | | | | | | |
|---|---|---|---|---|---|---|
| **Atomic No.** | **Element** | **Symbol** | **Data File** | **Emission Lines 4000-7000 Å** | **Jpeg Image** | **Original Data** |
| **1** | **Hydrogen** | H | hydrogen.txt | 5 | JPEG | hydrogen.dat.gz |
| **2** | **Helium** | He | helium.txt | 23 | JPEG | helium.dat.gz |
| **3** | **Lithium** | Li | lithium.txt | 24 | JPEG | lithium.dat.gz |
| **8** | **Oxygen** | O | oxygen.txt | 73 | JPEG | oxygen.dat.gz |
| **6** | **Carbon** | C | carbon.txt | 27 | JPEG | carbon.dat.gz |
| **7** | **Nitrogen** | N | nitrogen.txt | 84 | JPEG | nitrogen.dat.gz |
| **10** | **Neon** | Ne | neon.txt | 75 | JPEG | neon.dat.gz |
| **12** | **Magnesium** | Mg | magnesium.txt | 54 | JPEG | magnesium.dat.gz |
| **14** | **Silicon** | Si | silicon.txt | 109 | JPEG | silicon.dat.gz |
| **16** | **Sulfur** | S | sulfur.txt | 39 | JPEG | sulfur.dat.gz |
| **26** | **Iron** | Fe | iron.txt | 235 | JPEG | iron.dat.gz |
| **13** | **Aluminum** | Al | aluminum.txt | 38 | JPEG | aluminum.dat.gz |
| **20** | **Calcium** | Ca | calcium.txt | 78 | JPEG | calcium.dat.gz |
| **18** | **Argon** | Ar | argon.txt | 159 | JPEG | argon.dat.gz |
| **11** | **Sodium** | Na | sodium.txt | 90 | JPEG | sodium.dat.gz |
| **36** | **Krypton** | Kr | krypton.txt | 75 | JPEG | krypton.dat.gz |
| **38** | **Strontium** | Sr | strontium.txt | 54 | JPEG | strontum.dat.gz |
| **54** | **Xenon** | Xe | xenon.txt | 139 | JPEG | xenon.dat.gz |
| **56** | **Barium** | Ba | barium.txt | 92 | JPEG | barium.dat.gz |
| **All Spectra** | | High Resolution 784 X 64 | | | JPEG | catalog.dat.gz 306 KBytes |

## Lampiran 10

*Handbook* Data File Penelitian J. Reader dan Ch.H. Corliss pada Tahun 1981

### 1. Hydrogen

element

Both neutral and singly ionized helium contribute to the emission lines in this spectrum.
Different trial parameters :

- vary the lineWidth from 1 to 4 (2.5 is optimum)
- vary the contrast from 1 to 15 (10 is optimum)
- vary the continuum from 0 to 0.7 (0.3 is optimum)

data file

```
3970.07    8
4101.74   15
4340.47   30
4861.33   80
6562.72  120
6562.85  180
```

### 2. Oxigen

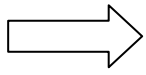
Element

Both neutral and singly ionized oxygen contribute to the emission lines in this spectrum.

Data file

```
3911.96  450
3919.29  160
3947.29  185
3947.48  160
3947.59  140
3954.37  220
3954.61  100
3973.26  450
3982.20  220
4069.90  160
4072.16  285
4075.87  450
```

| | |
|---|---|
| 4083.91 | 80 |
| 4087.14 | 50 |
| 4089.27 | 150 |
| 4097.24 | 110 |
| 4105.00 | 220 |
| 4119.22 | 285 |
| 4132.81 | 160 |
| 4146.06 | 50 |
| 4153.30 | 220 |
| 4185.46 | 285 |
| 4189.79 | 450 |
| 4233.27 | 80 |
| 4253.74 | 50 |
| 4253.98 | 50 |
| 4275.47 | 50 |
| 4303.78 | 50 |
| 4317.14 | 285 |
| 4336.86 | 160 |
| 4345.56 | 220 |
| 4349.43 | 285 |
| 4366.90 | 220 |
| 4368.25 | 100 |
| 4395.95 | 220 |
| 4414.91 | 450 |
| 4416.98 | 285 |
| 4448.21 | 160 |
| 4452.38 | 160 |
| 4465.45 | 50 |
| 4466.28 | 50 |
| 4467.83 | 50 |
| 4469.41 | 50 |
| 4590.97 | 360 |
| 4596.17 | 285 |
| 4609.39 | 80 |
| 4638.85 | 160 |
| 4641.81 | 360 |
| 4649.14 | 450 |
| 4650.84 | 160 |
| 4661.64 | 360 |
| 4676.23 | 285 |
| 4699.21 | 220 |
| 4705.36 | 285 |



| | |
|---|---|
| 4924.60 | 160 |
| 4943.06 | 220 |
| 5329.10 | 135 |
| 5329.68 | 160 |
| 5330.74 | 190 |
| 5435.18 | 90 |
| 5435.78 | 110 |
| 5436.86 | 135 |
| 5577.34 | 120 |
| 5958.39 | 160 |
| 5958.58 | 190 |
| 5995.28 | 80 |
| 6046.23 | 160 |
| 6046.44 | 190 |
| 6046.49 | 110 |
| 6106.27 | 100 |
| 6155.98 | 400 |
| 6156.77 | 450 |
| 6158.18 | 490 |
| 6256.83 | 80 |
| 6261.55 | 100 |
| 6366.34 | 100 |
| 6374.32 | 100 |
| 6453.60 | 320 |
| 6454.44 | 360 |
| 6455.98 | 400 |
| 6604.91 | 80 |
| 6653.83 | 100 |
| 7001.92 | 360 |
| 7002.23 | 450 |
| 7156.70 | 210 |

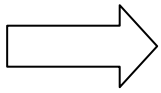
## 3. Carbon

Element

Both neutral and singly ionized carbon contribute to the emission lines in this spectrum.

data file

```
3918.98  570
3920.69  800
4074.52  250
4075.85  350
4267.00  800
4267.26 1000
4771.75  200
4932.05  200
5052.17  200
5132.94  350
5133.28  350
5143.49  350
5145.16  570
5151.09  400
5380.34  300
5648.07  250
5662.47  350
5889.77  570
5891.59  350
6001.13  200
```



```
6006.03  250
6007.18  110
6010.68  150
6013.22  300
6014.84  250
6578.05  800
6582.88  570
6587.61  200
6783.90  250
7113.18  250
7115.19  250
7115.63  250
7116.99  200
7119.90  350
```

**4. Nitrogen**

Element

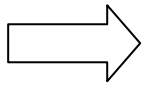
Both neutral and singly ionized nitrogen contribute to the emission lines in this spectrum.
Different trial parameters :

- vary the lineWidth from 1 to 4 (2.5 is optimum)
- vary the contrast from 1 to 10 (4 is optimum)
- vary the continuum from 0 to 0.7 (0.3 is optimum)

data file

```
3919.00  360
3955.85  450
3995.00 1000
4035.08  360
4041.31  550
4043.53  360
4099.94  140
4109.95  185
4176.16  285
4227.74  285
4236.91  285
```

| | |
|---|---|
| 4237.05 | 220 |
| 4241.78 | 450 |
| 4432.74 | 285 |
| 4447.03 | 650 |
| 4530.41 | 360 |
| 4601.48 | 550 |
| 4607.16 | 450 |
| 4613.87 | 360 |
| 4621.39 | 450 |
| 4630.54 | 870 |
| 4643.08 | 550 |
| 4788.13 | 285 |
| 4803.29 | 450 |
| 4847.38 | 180 |
| 4895.11 | 285 |
| 4914.94 | 160 |
| 4935.12 | 210 |
| 4950.23 | 160 |
| 4963.98 | 350 |
| 4987.37 | 285 |
| 4994.36 | 450 |
| 5001.48 | 650 |
| 5002.70 | 360 |
| 5005.15 | 870 |
| 5007.32 | 550 |
| 5010.62 | 450 |
| 5016.39 | 360 |
| 5025.66 | 360 |
| 5045.10 | 550 |
| 5281.20 | 185 |
| 5292.68 | 140 |
| 5495.67 | 450 |
| 5535.36 | 285 |
| 5666.63 | 650 |
| 5676.02 | 550 |
| 5679.56 | 870 |
| 5686.21 | 450 |
| 5710.77 | 450 |
| 5747.30 | 285 |
| 5752.50 | 700 |



| | |
|---|---|
| 5764.75 | 240 |
| 5829.54 | 265 |
| 5854.04 | 235 |
| 5927.81 | 360 |
| 5931.78 | 550 |
| 5940.24 | 285 |
| 5941.65 | 650 |
| 5952.39 | 285 |
| 5999.43 | 160 |
| 6008.47 | 210 |
| 6167.76 | 285 |
| 6379.62 | 360 |
| 6411.65 | 185 |
| 6420.64 | 210 |
| 6423.02 | 210 |
| 6428.32 | 210 |
| 6437.68 | 185 |
| 6440.94 | 235 |
| 6457.90 | 185 |
| 6468.44 | 300 |
| 6482.05 | 750 |
| 6482.70 | 360 |
| 6483.75 | 300 |
| 6481.71 | 265 |
| 6484.80 | 325 |
| 6491.22 | 160 |
| 6499.54 | 210 |
| 6506.31 | 185 |
| 6610.56 | 750 |
| 6622.54 | 185 |
| 6636.94 | 185 |
| 6644.96 | 235 |
| 6646.50 | 185 |
| 6653.46 | 235 |
| 6656.51 | 210 |
| 6722.62 | 185 |

**Lampiran 11**

Alat-Alat Penelitian

Sumber Tegangan Masukan Hipotronik

Fotodioda BPX 65

Spektrometer Plasma dengan Monokromator Jobin Yvon H 25

Tabung Plasma