

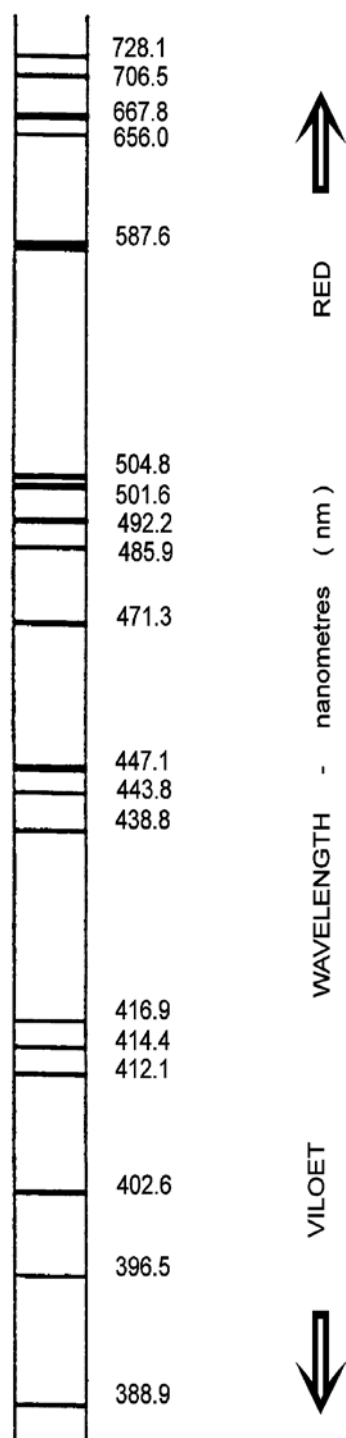
APPENDIX 2 - SPECTRAL WAVELENGTH TABLES

Remarks on the use of the tables

- 1) Use the intensity indications with caution. They are meant only as a general guide. Relative intensities vary widely depending on the mode of excitation and so the source that you are using may have lines with different intensities. However, the very bright lines should appear bright in all sources.
- 2) These tables give most of the lines that you will be able to see (and many that you won't be able to see if you are using a narrow slit width). However, the tables are not complete and lack some faint lines.
- 3) Lines separated by less than one nanometre will not be resolved if the slit is wide. If the slit is too narrow, weak lines won't be seen.
- 4) You may assume that the errors in these values are negligible in comparison to the other errors in this experiment.

HELIUM

WAVELENGTH <i>nm</i>	RELATIVE INTENSITY	COLOUR
728.1	2	RED
706.5	4	RED
667.8	6	RED
656.0	1	RED
587.6	10	YELLOW
504.8	4	GREEN
501.6	6	GREEN
492.2	5	GREEN
485.9	2	GREEN
471.3	5	BLUE
447.1	6	BLUE
443.8	1	VIOLET
438.8	4	VIOLET
416.9	1	VIOLET
414.4	2	VIOLET
412.1	3	VIOLET
402.6	4	VIOLET
396.5	1	VIOLET
388.9	3	VIOLET



ARGON

<i>WAVELENGTH</i> <i>nm</i>	<i>RELATIVE</i> <i>INTENSITY</i>	<i>COLOUR</i>
574.0	2	GREEN
565.0	3	GREEN
560.7	3	GREEN
557.3	3	GREEN
549.6	3	GREEN
522.1	2	GREEN
518.8	3	GREEN
516.2	3	GREEN
470.2	1	BLUE
462.8	1	BLUE
459.6	1	BLUE
452.2	1	VIOLET
451.1	2	VIOLET
433.5	2	VIOLET
433.4	2	VIOLET
430.0	3	VIOLET
426.6	3	VIOLET
425.9	3	VIOLET
420.1	2	VIOLET
419.8	2	VIOLET
416.4	3	VIOLET
415.9	2	VIOLET

KRYPTON

<i>WAVELENGTH</i> <i>nm</i>	<i>RELATIVE</i> <i>INTENSITY</i>	<i>COLOUR</i>
645.6	5	RED
642.1	5	RED
605.6	2	RED
601.	2	ORANGE
599.	2	ORANGE
588.	1	ORANGE
587.	10	ORANGE
584.	1	YELLOW
583.	1	YELLOW
570.	1	GREEN
567.	1	GREEN
565.	1	GREEN
558.	1	GREEN
557.	10	GREEN
556.	2	GREEN
450.	5	VIOLET
446.	5	VIOLET
445.	5	VIOLET
440.	2	VIOLET
437.	5	VIOLET
436.	4	VIOLET
432.	3	VIOLET
431.	2	VIOLET
427.	5	VIOLET

Argon has many faint lines in the red and yellow which vary in intensity depending on the source and because of the confusion that this can lead to only wavelengths less than 580 nm are given. In this region there are a very large number of lines. Only relatively brighter ones are listed. Fainter ones may provide a haze in the background.

MERCURY

<i>WAVELENGTH nm</i>	<i>RELATIVE INTENSITY</i>	<i>COLOUR</i>
708.2	1	RED
704.5	2	RED
690.7	1	RED
671.6	1	RED
658.5	1	RED
638.3	2	RED
623.4	2	RED
612.3	2	RED
607.3	2	ORANGE
602.4	2	ORANGE
601.7	1	ORANGE
589.0	1	YELLOW
579.1	8	YELLOW
577.0	6	YELLOW
567.7	1	YELLOW
567.6	1	YELLOW
546.1	10	GREEN
536.5	1	GREEN
520.5	1	GREEN
519.6	1	GREEN
512.1	1	GREEN
504.6	1	GREEN
502.6	1	GREEN
496.0	1	GREEN
491.6	5	BLUE
452.3	1	BLUE
435.8	6	VIOLET
434.8	2	VIOLET
433.9	1	VIOLET
421.2	1	VIOLET
420.6	1	VIOLET
415.7	1	VIOLET
407.8	5	VIOLET
414.7	5	VIOLET

XENON

<i>WAVELENGTH nm</i>	<i>RELATIVE INTENSITY</i>	<i>COLOUR</i>
647.3	2	RED
647.0	3	RED
631.8	5	RED
620.1	1	RED
619.8	1	RED
618.2	3	RED
618.0	1	RED
617.8	2	RED
616.4	1	RED
593.4	2	ORANGE
593.1	1	ORANGE
589.5	2	ORANGE
587.5	1	ORANGE
582.5	2	YELLOW
582.4	3	YELLOW
571.6	1	YELLOW
569.7	1	YELLOW
569.6	1	YELLOW
546.0	1	GREEN
539.3	1	GREEN
502.8	3	GREEN
492.3	4	GREEN
491.7	4	GREEN
484.3	4	GREEN
483.0	4	GREEN
480.7	5	GREEN
479.3	1	BLUE
473.4	5	BLUE
469.7	4	BLUE
467.1	10	BLUE
462.4	5	BLUE
458.3	1	VIOLET
452.5	2	VIOLET
450.1	2	VIOLET

NEON

<i>WAVELENGTH nm</i>	<i>RELATIVE INTENSITY</i>	<i>COLOUR</i>
724.5	1	RED
717.4	1	RED
703.2	5	RED

NITROGEN

<i>WAVELENGTH nm</i>	<i>RELATIVE INTENSITY</i>	<i>COLOUR</i>
497.6	3	GREEN
491.7	3	GREEN
481.5	3	GREEN

SPECTRA

702.4	3	RED	472.4	3	BLUE
692.9	6	RED	466.7	3	BLUE
667.8	7	RED	464.9	3	BLUE
659.9	7	RED	457.4	3	BLUE
653.3	7	RED	449.0	3	BLUE
650.7	7	RED	441.7	3	VIOLET
609.6	5	ORANGE	435.5	3	VIOLET
607.4	7	ORANGE	434.4	2	VIOLET
603.0	5	ORANGE	427.0	2	VIOLET
596.5	4	ORANGE	420.1	2	VIOLET
588.2	6	YELLOW	414.2	2	VIOLET
585.2	10	YELLOW	409.5	1	VIOLET
540.1	5	GREEN	406.0	1	VIOLET
			399.8	1	VIOLET
			394.3	1	VIOLET

Many orange and yellow lines have been omitted as well as all lines of wavelength less than 540 nm (hundreds). Most of these are faint but some overlap to give the appearance of bright lines.

Since **nitrogen** is a molecule, the spectrum consists of bands rather than lines. This is due to rotation of the molecules. In the visible the most prominent structure is the First Positive series with about 30 regularly spaced bands in the region 500- 700 nm. Only the band heads of the Second Positive series are tabled above. The bands trail off to shorter wavelengths. As indicated by the relative intensities on a scale of 10, the Second Positive series is less intense than the First Positive series.