LAMPIRAN

PEMBIASAN PADA PRISMA

Sebuah sinar yang mengenai salah satu permukaan prisma dengan sudut datang ϕ_1, Indeks bias prisma n,sudut aspeknya A, dan medium di luar prisma adalah udara. Deviasi yang disebabkan oleh pembiasan pertama adalah δ_1 dan oleh pembiasan kedua ϕ_2.

$$\delta = \delta_1 + \delta_2 = \phi_1 - \rho_1 + \phi_2 - \rho_2$$

atau

$$\delta = \phi_1 + \phi_2 - (\rho_1 + \rho_2)$$

$\rho_1 + \rho_2$ adalah suplemen sudut C,begitu pula halnya dengan sudut A. Sebab itu $\rho_2 + \rho_2 = A$,

dan $\delta = \phi_1 + \phi_2 - A$

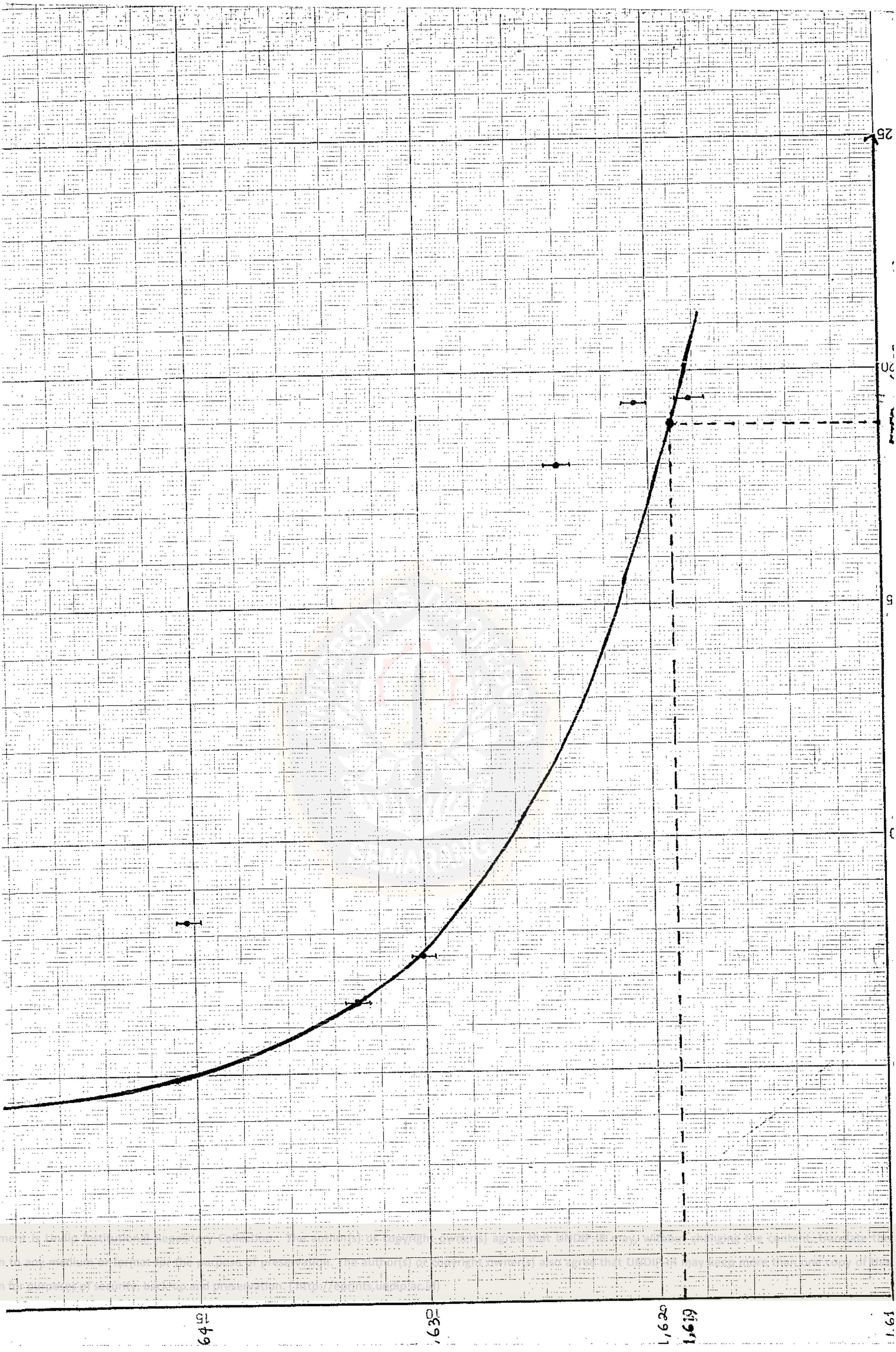
Bila diukur sebagai fungsi ϕ_1, ternyata bahwa kalau ϕ bertambah besar, maka δ mulai mengecil, lalu mencapai minimum dan setelah itu bertambah besar. Untuk mengetahui keadaan waktu minimum cukuplah hanya mendeferensialkan pertama δ terhadap ϕ_1 sama dengan nol.

Menurut hukum Snellius terhadap pembiasan pertama :

$\sin \phi_1 = n \sin \rho_1$

$\phi_1 = \text{arc sin} (n \sin \rho_1)$

Pembiasan kedua menghasilkan



Sensitive Lines of the Elements Arranged According to Elements*

Wavelength	Intensities: Arc	Intensities: Spk. [Dis.]	Sensitivity
A 18 Argon			
3115.311	..	[5000]	U2
7503.867	..	[700]	U4
7067.217	..	[800]	U3
6965.430	..	[500]	U3
Ag 47 Silver			
3465.487	1000 R	500 R	U4
3209.067	1500 R	1000 R	U3
3382.891	1000 R	700 R	U2
3280.683	2000 R	1000 R	U1
2437.791	60	500 wh	V2
2946.412	25	300 hs	V3
Al 13 Aluminum			
6243.36	..	100	V3
6231.76	..	30	..
3961.527	3000	2000	U1
3944.032	2000	1000	U2
3092.713	1000	1000	U3
3082.155	800	800	U4
2816.179	10	100	V2
2669.166	3	100	V1
2631.353	..	40	..
As 33 Arsenic			
2998.71	25 r	40	..
2860.452	50 r	50	..
2780.197	75 R	75	U3
2456.53	100 r	8	U4
2370.77	50 r	3	..
2369.67	40 r	..	..
2349.84	250 R	18	U3
2288.12	250 R	5	U3
Au 79 Gold			
2302.19	..	200	..
2675.95	250 R	100	U2
2427.95	400 R	100	U1
B 5 Boron			
3451.41	5	30	V2
2497.733	500	400	U1
2496.778	300	300	U2
Ba 56 Barium			
5777.665	500 R	100 R	U2
5535.551	1000 R	200 R	U1
5519.115	200 R	60 R	U3
5424.616	100 R	30 R	U4
4934.086	400 h	400 h	V2
4554.042	1000 R	200	V1
4130.664	50 r	60 wh	V3
3891.785	18	25	V4
3071.591	100 R	50 R	U5
2935.269	60 R	100 R	..
2304.235	60 R	90 R	..
Be 4 Beryllium			
3321.343	1000 r	30	U2
3321.080	100	..	U5
3321.013	50	..	U4
3131.072	200	150	V2
3130.416	200	200	V1
2650.731	25	..	U5
2348.610	2000 R	50	U1
Bi 83 Bismuth			
4722.552	1000	100	..
3067.710	3000 hR	2000 wh	U1
2989.029	250 wh	100 wh	..
2938.298	300 w	300 w	..
2897.975	500 WR	500 WR	U2
2809.625	200 w	100	..
2780.521	200 w	100	..
2276.578	100 R	40	..
2061.70	300 R	100	..
Br 35 Bromine			
4816.71	..	[300]	V3
4785.50	..	[400]	V2
4704.86	..	[250]	V1
C 6 Carbon			
4267.27	..	500	V2
4267.02	..	350	V3
2837.002	..	40	V5
2836.710	..	200	V4
2478.573	400	[400]	U2
2296.89	..	200	..
Ca 20 Calcium			
4454.781	200	..	U2
4434.960	150	..	U3
4425.441	100	..	U4
4226.728	500 R	50 W	U1
3968.468	500 R	500 R	V2
3933.666	600 R	600 R	V1
3179.332	100	400 w	V3
3158.869	100	300 w	V4
Cb 41 Columbium			
4137.095	100	60	U5
4123.810	200	125	U4
4100.923	300 w	200 w	U3
4079.729	500 w	200 w	U2
4068.038	1000 w	400 w	U1
3225.479	150 w	800 wr	..
3194.977	30	300	..
3163.402	15	8	..
3130.736	100	100	..
3094.183	100	1000	V1
Cd 48 Cadmium			
6438.4696	2000	1000	..
3610.510	1000	500	..
3466.201	1000	500	..
3403.653	800	500 h	..
3261.057	300	300	..
2748.68	5	200	..
2573.09	3	150	..
2312.84	1	200	..
2288.018	1500 R	300 R	U1
2265.017	25 d	300	V2
2144.389	50	200 R	V1
Ce 58 Cerium			
4186.599	80	25	..
4165.606	40	6	..
4040.762	70	5	..
4012.388	60	20	..
Cl 17 Chlorine			
4819.46	..	[200]	V4
4810.06	..	[300]	V3
4794.54	..	[250]	V2
Co 27 Cobalt			
3529.813	1000 R	30	U3
3405.800	2000 R	25	U2
3453.505	3000 R	200	U1
3405.120	2000 R	150	..
2519.822	40	200	..
2388.018	10	35	..
2378.022	25	50 w	..
2363.737	25	50	..
2307.357	25	50 w	..
2286.156	10	300	V1
Cr 24 Chromium			
5208.436	500 R	100	U4
5206.019	500 R	200	U5
5204.513	800 R	100	U6
4289.721	3000 R	800 r	U3
4274.803	4000 R	800 r	U2
4254.346	5000 R	1000	U1
2860.931	60	100	..

* Compiled from a combination of empirical and theoretical data selected from the literature, and reprinted by permission from the *M.I.T. Wavelength Tables*, G. R. Harrison, ed., published by John Wiley & Sons, Inc., and the Technology Press.

For the neutral atom, the most sensitive line (*raie ultime*) is indicated by U1, and other lines by U2, U3, and so on, in order of decreasing sensitivity. For the singly ionized atom, the corresponding designations are V1, V2, and soon. In cases where U1 or V1 is not given, the most sensitive lines lie outside the spectral range 10,000–2000 A.

Wave-length	Intensities: Arc	Intensities: Spk. [Dis.]	Sensitivity
Cr 24 Chromium (*cont.*)			
2855.676	60	200 wh	V4
2849.833	80	150 r	V3
2843.252	125	400 r	V2
2835.633	100	400 r	V1
Cs 55 Caesium			
8943.50	2000 R	..	U2
8521.10	5000 R	..	U1
4593.177	1000 R	50	U4
4555.355	2000 R	100	U3
Cu 29 Copper			
5218.202	700	..	U3
5153.235	900	..	U4
5105.541	500	..	U5
3273.962	3000 R	1500 R	U2
3247.540	5000 R	2000 R	U1
2246.995	50	500	V3
2192.260	25	500 h	V2
2135.076	25	500 w	V1
Dy 66 Dysprosium			
4211.719	200	15	..
4167.968	50	12	..
4077.974	150 r	100	..
4046.983	150	12	..
4000.454	400	300	..
Er 68 Erbium			
3906.316	25	12	..
3692.652	20	12	..
3499.104	18	15	..
Eu 63 Europium			
4205.048	200 R	30	..
4129.737	150 R	50 R	..
F 9 Fluorine			
6902.46	..	[500]	U3
6868.02	..	[1000]	U2
6281.0	300	..	..

Wave-length	Intensities: Arc	Intensities: Spk. [Dis.]	Sensitivity
Fe 26 Iron			
3748.264	500	200	U4
3745.903	150	100	U5
3745.564	500	300	U3
3737.133	1000 r	600	U2
3719.935	1000 R	700	U1
2413.309	60	100 h	V3
2410.517	50	70 h	V4
2404.882	50	100 wh	V3
2305.625	50	100 wh	V2
2382.039	40 r	100 R	V1
Ga 31 Gallium			
4172.056	2000 R	1000 R	U1
4032.982	1000 R	500 R	U2
2943.637	10	20 r	U3
2874.244	10	15 r	U4
Gd 64 Gadolinium			
3768.405	20	20	..
3646.106	200 w	150	..
Ge 32 Germanium			
4226.570	200	50	..
3269.494	300	300	U3
3039.064	1000	1000	U2
2709.626	30	20	..
2651.575	30	20	..
2651.178	40	20	..
H 1 Hydrogen			
6562.70	..	[3000]	U2
4861.327	..	[500]	U3
He 2 Helium			
5875.618	..	[1000]	U3
4686.75	..	[300]	..
3888.646	..	[1000]	U2
Hf 72 Hafnium			
4093.161	25	20	..
3134.718	80	125	..
3072.377	80	18	..
2940.772	60	12	..
2916.481	50	15	..
2904.408	30	6	..

Wave-length	Intensities: Arc	Intensities: Spk. [Dis.]	Sensitivity
Hf 72 Hafnium (*cont.*)			
2898.259	50	12	..
2820.224	40	100	..
2773.357	25	60	..
2641.406	40	125	..
2516.881	35	100	..
2513.023	25	70	..
Hg 80 Mercury			
5460.740	..	[2000]	..
4358.35	3000 w	500	..
4046.561	200	300	..
3663.276	500	400	U5
3654.833	..	[200]	U4
3650.146	200	500	U3
2536.519	2000 R	1000 R	U2
Ho 67 Holmium			
3891.02	200	40	..
3748.17	60	40	..
2936.77	..	1000 R	..
I 53 Iodine			
5464.81	..	[900]	..
5161.188	..	[300]	..
2062.38	..	[900]	..
In 49 Indium			
4511.323	5000 R	4000 R	U1
4101.773	2000 R	1000 R	U2
3258.564	500 R	300 R	U5
3256.090	1500 R	600 R	U3
3039.356	1000 R	500 R	U4
Ir 77 Iridium			
3513.645	100 h	100	U2
3437.615	20	15	..
3220.780	100	30	U1
3024.792	25 wh	15	..
2849.725	40 h	20 h	..
K 19 Potassium			
7698.979	5000 R	..	U2
7664.907	9000 R	..	U1
4047.201	400	200	U4
4044.140	800	400	U3

Wave-length	Intensities: Arc	Intensities: Spk. [Dis.]	Sensitivity
Kr 36 Krypton			
5870.9158	..	[2000]	U2
5570.2896	..	[2000]	U3
La 57 Lanthanum			
6249.929	300	..	U1
5030.648	250	..	U2
5455.148	200	1	U3
4123.223	500	500	V4
4077.340	600	400	V3
3949.100	1000	800	V2
Li 3 Lithium			
6707.844	3000 R	300	U1
6103.642	2000 R	300	U3
4603.00	300	..	U4
3232.61	1000 R	500	U2
Lu 71 Lutecium			
4518.37	300	40	..
3554.43	50	150	..
3472.48	50	150	..
3397.07	50	20 r	..
2911.39	100	300	..
2804.84	60	200	..
Mg 12 Magnesium			
5183.618	500 wh	300	..
5172.699	200 wh	100 wh	..
5167.343	100 wh	50	..
3838.258	300	200	U2
3832.306	250	200	U3
3829.350	100 w	150	U4
2852.129	300 R	100 R	U1
2802.695	150	300	V2
2795.53	150	300	V1
Mn 25 Manganese			
4034.490	250 r	20	U3
4033.073	500 r	20	U2
4030.755	500 r	20	U1
2605.688	100 R	500 R	V3
2593.729	200 R	1000 R	V2
2576.104	200 R	800 R	V1

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
Mo 42 Molybdenum			
3902.963	1000 R	500 R	U3
3864.110	1000 R	500 R	U2
3798.252	1000 R	1000 R	U1
2909.116	25	40 h	V5
2890.294	30	50 h	V4
2871.509	100	100 h	V3
2848.252	125	200 h	V2
2816.154	200	300 h	V1
N 7 Nitrogen			
5679.56	..	[500]	V2
5676.02	..	[100]	V4
5666.64	..	[300]	V3
4109.98	..	[1000]	U2
4103.37	..	[80]	..
4099.94	..	[150]	U3
4097.31	..	[100]	..
Na 11 Sodium			
5895.923	5000 R	500 R	U2
5889.953	9000 R	1000 R	U1
5688.224	300	..	..
5682.657	30	..	..
3302.988	300 R	150 R	U4
3302.323	600 R	300 R	U3
Nd 60 Neodymium			
4303.573	100	40	..
4177.321	15	25	..
3951.154	40	30	..
Ne 10 Neon			
6402.246	..	[2000]	..
5852.488	..	[3000]	..
5400.562	..	[2000]	..
Ni 28 Nickel			
3524.541	1000 R	100 wh	..
3515.054	1000 R	50 h	..
3492.958	1000 R	100 h	U2
3414.765	1000 R	50 wh	U1
2937.084	100	500	V1
2870.213	100	400	V2
2804.457	150	400	V3
2953.36	100	300	V4

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
O 8 Oxygen			
7775.493	..	[100]	U4
7774.133	..	[300]	U3
7771.923	..	[1000]	U2
Os 76 Osmium			
4420.463	400 R	100	..
3267.945	400 R	30	..
3262.290	500 R	50	..
3058.66	500 R	500	..
2909.061	500 R	400	U1
P 15 Phosphorus			
2554.93	60	[20]	..
2553.28	80	[20]	U3
2535.65	100	[30]	U2
2534.01	50	[20]	..
Pb 82 Lead			
5608.8	..	[40]	V2
4057.820	2000 R	300 R	U1
3683.471	200	50	U2
3639.580	300	50 h	..
2833.069	500 R	80 R	..
2614.178	200 r	80	..
2203.505	50 W	5000 R	V1
2169.994	1000 R	1000 R	..
Pd 46 Palladium			
3634.695	2000 R	1000 R	U3
3609.548	1000 R	700 R	..
3516.943	1000 R	500 R	..
3421.24	2000 R	1000 R	U2
3404.580	2000 R	1000 R	U1
2854.581	4	500 h	..
2658.722	20	300	..
2505.759	3	30	..
2498.784	4	150 h	..
2488.921	10	30	..
Pr 59 Praseodymium			
4225.327	150	40	..
4189.513	100	50	..
4179.422	200	40	..
4062.317	150	50	..

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
Pt 78 Platinum			
3064.712	2000 R	500 R	U1
2997.967	1000 R	200 r	..
2929.794	300 R	200 w	..
2830.296	1000 R	600 r	..
2659.464	2000 R	500 R	U2
Ra 88 Radium			
4825.91	..	[300]	U1
4682.23	..	[800]	V2
3814.42	..	[2000]	V1
Rb 37 Rubidium			
7947.60	5000 R	..	U2
7800.227	9000 R	..	U1
4215.556	1000 R	300	U4
4201.851	2000 R	500	U3
Re 75 Rhenium			
4889.17	2000 w	..	U2
3460.47	1000 W	..	U1
Rh 45 Rhodium			
3692.357	500 hd	150 wd	..
3687.987	500 W	200 W	..
3434.893	1000 r	200 r	U1
3396.85	1000 w	500	..
3325.092	1000	200	..
Rn 86 Radon			
7450.00	..	[600]	U2
7055.42	..	[400]	U3
Ru 44 Ruthenium			
3500.179	30	100	U3
3498.942	500 R	200	U1
3436.737	300 R	150	U2
2976.586	80	200	..
2965.546	80	200	..
2945.068	80	300	..
2712.410	30	300	..
2992.005	3	300	..
2678.758	100	300	..

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
S 16 Sulphur			
9237.40	..	[200]	U6
9228.11	..	[200]	U5
9212.91	..	[200]	U4
4696.25	..	[15]	U9
4695.45	..	[30]	U8
4694.13	..	[500]	U7
Sb 51 Antimony			
3267.502	150	150 Wh	..
3232.499	150	250 wh	..
2877.915	250 W	150	..
2508.082	200	100	..
2528.535	300 R	200	..
2311.469	150 R	50	..
2175.890	300	40	U2
2068.38	300 R	3	U1
Sc 21 Scandium			
4023.688	100	25	U3
4020.390	50	20	U4
3911.810	150	30	U1
3907.476	125	25	U2
3642.785	60	50	V3
3630.740	50	70	V2
3613.836	40	70	V1
Se 34 Selenium			
4742.25	..	[500]	U6
4739.03	..	[300]	U5
4730.78	..	[1000]	U4
2002.788	..	[800]	U3
2039.851	..	[1000]	U2
Si 14 Silicon			
3905.528	20	15 W	..
2881.578	500	400	U1
2528.516	400	300	U2
2516.123	300	300	U3
2506.899	300	200	U4
Sm 62 Samarium			
4434.321	200	200	V2
4424.342	300	300	V1
4300.865	150	150	..

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
Sn 50 Tin			
4524.741	500 wh	50	..
3262.328	400 h	300 h	U3
3175.019	500 h	400 hr	..
3034.121	300 wh	150 wh	..
3009.147	300 h	200 h	..
2863.327	300 R	300 R	U2
2839.989	300 R	300 R	U1
Sr 38 Strontium			
4962.263	40	..	U4
4872.493	25	..	U3
4832.075	200	8	U2
4607.331	1000 R	50 R	U1
4305.447	40	..	..
4215.524	300 r	400 W	V2
4077.714	400 r	500 W	V1
3474.887	80	50	..
3464.57	200	200	..
3380.711	150	200	..
Ta 73 Tantalum			
3406.664	70 w	13 s	..
3318.340	125	35	..
3311.162	300 w	70 w	U1
Tb 65 Terbium			
3874.18	200	200	..
3848.75	100	200	..
3561.74	200	200	..
3509.17	200	200	..
Te 52 Tellurium			
2769.67	..	[30]	..
2550.70	..	[30]	..
2385.76	600	[300]	U2
2383.25	500	[300]	U3
2142.75	60 R	..	..
Th 90 Thorium			
4019.137	8	8	..
3601.910	8	10	..
3568.75	..	50	..
3290.59	..	40 h	..

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
Ti 22 Titanium			
5007.213	200	40	..
4999.510	200	80	..
4991.066	200	100	..
4981.733	300	125	U1
3653.496	500	200	U2
3642.675	300	125	..
3635.463	200	100	..
3383.761	70	300 R	..
3372.800	80	400 R	V3
3361.213	100	600 R	V2
3349.035	125	800 R	V1
Tl 81 Thallium			
5350.46	5000 R	2000 R	U1
3775.72	3000 R	1000 R	U2
3519.24	2000 R	1000 R	U3
3229.75	2000	800	..
2918.32	400 R	200 R	..
2767.87	400 R	300 R	..
Tm 69 Thulium			
3761.917	200	120	..
3761.333	250	150	..
3462.21	200	100	..
U 92 Uranium			
4241.669	40	50	..
3672.579	8	15	..
3552.172	8	12	..
V 23 Vanadium			
4389.974	80 R	60 R	..
4384.722	125 R	125 R	..
4379.223	200 R	200 R	U1
3185.396	500 R	400 R	U2
3183.982	500 R	400 R	..
3183.406	200 R	100 R	..
3125.284	80	200 R	..
3118.383	70	200 R	V4
3110.708	70	200 R	V3
3102.290	70	200 R	V2
3093.108	100 R	400 R	V1

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
W 74 Tungsten			
4302.108	60	60	U1
4294.614	50	50	U2
4008.753	45	45	U3
3613.790	10	30	..
3215.560	10	9	..
2580.167	15 d	25	..
2567.001	18	30	..
Xe 54 Xenon			
4671.226	..	[2000]	U2
4624.276	..	[1000]	U3
4500.977	..	[500]	U4
Yb 70 Ytterbium			
3987.994	1000 R	500 R	..
3694.203	500 R	1000 R	..
3289.37	500 R	1000 R	..
Yt 39 Yttrium			
4874.848	80	100	U1
4648.805	50	100	U2
3788.697	30	30	..
3774.332	12	100	..
3710.290	80	150	V1
3633.123	50	100	..
3600.734	100	300	..
3242.280	80	100	..

Wave-length	Intensities		Sensitivity
	Arc	Spk. [Dis.]	
Zn 30 Zinc			
6362.347	1000 Wh	500	..
4810.534	400 w	300 h	..
4722.159	400 w	300 h	..
4680.138	300 w	200 h	..
3345.020	800	300	U2
3302.588	800	300	U3
3282.333	500 R	300	U4
2557.958	10	300	V3
2502.001	20	400 w	V4
2138.56	800 R	500	U1
2061.91	100	100	V2
2025.51	200	200	V1
Zr 40 Zirconium			
4772.312	100	..	..
4739 478	100	..	..
4710.075	60	..	..
4687.803	125	..	U4
3001.193	400	15	U1
3572.373	80	80	V4
3547.682	200	12	U2
3510.006	100	10	U3
3496.210	100	100	V3
3438.230	250	200	V2
3391.975	300	400	V1