H hydrogen						X		ra	Ŋ		۱b	S ()r	pt	io		a	nc		E	m	is	Si()		=n	ei	g	ie	S	O	ft	:h	e	E	lei	m	er	1t	S									25	helium	2
Li 3	Ве	e	4																															В		5	С		6	N		7	0		8	F		9	4.0026 Ne		10
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55 5	1	12 108 8 3										Data an am, B.		_		مامد																		188 13 5	183		284 2 18 7	277		410 37 18	392		54 4 1	52 2 3	5	6	697 45 20	677	870 48 22	84	,
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94 +1	9.012		+2					name	T 7					C	•1 •		C.																	10.81		+3	12.011	-4, -3,, -	+2, +3, +4	14.007		-3, +3, +5)	-:	2 18.99		:	20.1797		
Va 11 sodium	M	lg magnesiu	12 .m				\mathbf{K} edge \mathbf{L}_1 edge \mathbf{L}_2 edge	$egin{array}{c} \mathbf{K}_{lpha_1} \ \mathbb{L}_{eta_3} \ \mathbb{L}_{eta_1} \end{array}$	$egin{array}{c} \mathbf{K}_{eta_1} \ \mathrm{L}_{eta_4} \ \mathrm{L}_{\gamma_1} \end{array}$			oxidat eenwoo			-	edia.org	g, after																	Al	minur	13		silicon	14	_	ospho		S	sulfu		CI	chlori		Ar	argon	18
1071 1040		03 1254	1302				$egin{array}{c} \mathbf{L}_3 & \textbf{edge} \\ \mathbf{M}_5 & \textbf{edge} \end{array}$	$egin{aligned} \mathbf{L}_{lpha_{1}} \ \mathrm{M}_{lpha} \end{aligned}$	$\mathbf{L}_{eta_{2}}^{''} \ \mathrm{M}_{eta}$			y of the				1997).																		1559	1486	1557	1839	1740	1837	2146	2010	2140	2472	2310	246	282	2 2622	2812	3206	2958	3190
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2.9898 +1	24.30	.05	+2							En	nission	line sti	ength	are ap	oroxima	te, and	l vary v	with ele	ment.															26.9815		+3	28.085		-4, +4	30.9738	·	-3, +3, +5	32.06	-2	2, +2, +4, +6	35.45	i3 -1, ⊣	-1, +3, +5, +	39.948		
K 19			20	Sc		21	Ti		22	V		23	Cr		24	Mn		25	Fe		26	Co		27	Ni		28	Cu		29	Zn		30	Ga		31	Ge			As			Se		34				Kr		36
potassium		calcium	1	SC	andium		_	taniuı			anadi			hromiu			angan			iron			cobal			nickel			coppe			zinc			allium		gei	maniu	ım		arseni			seleniu	ım		bromi			crypto	n
3608 3314 3590 379 360 360 297 360 360	403 43 3!	38 3692 38 413 50	4013 413	4492 498 404	4093 470	4464 470	4966 561 460	4512 528 458	4933 528	546! 627 520	5 4953 7 590 518	5428 590	598 69 58	5415 654 582	5947 654	6539 769 650	5900 722 648	6492 722	7112 845 720	6405 792 718	7059 792	770 92 79	6931 865 790	7649 866	8333 1009 870	7480 942 866	8267 941	8979 1097 952	8046 1022 947	8904 1019	9659 1196 1045	8637 1108 1035	9570 1105	10367 1299 1143	9251 1199 1124	10267 1196	11103 1415 1248	9886 1294 1218	10982 1290	11867 1527 1359	10543 1386 1317	11726 1381	1265 165 147	3 11224 2 1491 1419	12497 148	7 1347 5 178 159	 1192 160 152 	4 1329 2 0 1593 6	14326 1921 1731	12648 1707 1636	14112 1699
295	34	46		399			454 2	452		2	2 510 2		57			2	637		707 2	705		77	3		853 4	ļ		933 5			1022 10	1012			1098			1188		1324 42	1282		143 5	5		155 6	50 148 59	1	1678 94	1585	
9.0983 +1	40.0		+2	44.9559			47.867		+3, +4	50.941!		-2, +3, +4, +!	51.99		+2, +3, +6	54.938	+2,	+3, +4, +7	55.845		+2, +3	58.933	2	+2, +3	58.6934	1	+2	63.546		+1, +2	65.38		+2	69.72		+3	72.63		-, , _, , -	74.9216		-3, +3, +5	78.97		2, +2, +4, +6	79.90)4	-1, +1, +3, +			
Rb 37 rubidium		strontiui	38 m		trium	39		rconiu		Nb	າiobiເ		Mo m	olybde		Tc te	chneti		Ru ru	ıtheni		Rh	hodiu		Pd pa	alladiu		Ag	silver		Cd	admiur	48 n		dium	49	Sn	tin	50	Sb	ntimo		Te	telluriu	52 um	I	iodir		Xe	xenon	54
15200 13396 14961 2065 1826 1816	1610 221		15835 1936	17038	14958	16739	17998 2532	15775 2202		18986 2698	6 1661 8 233		20000	17480	19606	21044 3043	18367 2625		22117 3224	19279 2762			20216	22724 2891	24350	21177	23818	25514 3806	22163	24941	26711 4018	23173 3400	26093 3365	27940 4238	24210 3573	27275 3535	29200 4465	25271 3750	28485 3708	30491 4698	26359	29725		27473 4118		331 3 51	.69 28612		34561 5453	29775 4512	33620 4451
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112 5.4678 +1	87.6	34 52	+2	156 88.9058		+3	179 91.224		+4	92.9064		+4, +5	95.95		+3, +4, +6	254 97.907		+4, +7	280 101.07		+3, +4, +6	30° 102.90°	, j	+2, +3, +4	335 106.42		+2, +4	368 107.868		+1	405 112.414		+2	444 114.818		+3	485 118.71		-4, +2, +4	528 121.76	528	538 -3, +3, +5	573 5 127.6	573 -2	583 2, +2, +4, +6	6 126.9	619 619 005 -1, -	633	131.293		689
Cs 55	Ba	a	56	La		57	Hf		72	Та		73	W		74	Re		75	Os		76	Ir		77	Pt		78	Au		79	Hg		80	TI		81	Pb		82	Bi		83	Po		84	At		85	Rn		86
cesium		barium		lan	thanum	1	h	afniur	n	t	antal	um		ungst	en	r	heniu	m		osmiu	m		iridiun	n	p	latinui	n		gold		n	nercury	y	th	allium	1		lead		b	oismut	h		ooloniu	ım		astati	ne		radon	
5714 4711 4643 5359 4618 5279	59	989 4926 624 4828	36378 4852 5531	38925 6266 5891	5138 5038	5057 5786	05351 11271 10739	9164 9023	8906 10519	11682 11130	5 5753 2 948 6 934	35 65222 38 9213 43 10898	6952 1210 1154	59318 9819 9672	67244 9525 11288	12527 11959	61141 10160 10010	9845 11685	73871 12968 12385	10511 10354	10176 12092	7611 1341 1282	10868 10708	7 3560 10510 12512	78395 13880 13273	66831 11235 11071	75750 10853 12941	80725 14353 13734	68806 11610 11443	77982 11205 13381	83102 14839 14209	70818 11992 11824	80255 11560 13831	85530 15347 14698	72872 12390 12213	11931 14292	15861 15200	74970 12795 12614	12307 14766	90526 16388 15711	13211 13023	87349 12692 15247	93105 2 16939 7 16244	79291 13637 13446	89803 1308' 1574	3 95730 5 17493 4 16785	3 1406 5 1387	b 9230 4 7 1348! 6 16252	98404 18049 17337	83785 14511 14315	13890 16770
5012 4285 4932 727 727 740	52	247 4466 780 780	5154 796	5483 836	4647 836	5378 853	9561 1662	7899 1646	9341 1700	9883 173	1 81 4 5 171	6 964 3 1770	1020 180	8398 1775	9951 1838	10535 1883	8652 1840	10261 1906	10871 1960	8911 1907	10578 1978	1121 204	9175 1976	10903 2052	11564 2122	9442 2048	11232 2128	11919 2206	9713 2118	11566 2203	12284 2295	9989 2191	11906 2281	12658 2389	10269 2267	12252 2363	13035 2484	10551 2342	12601 2444	13419 2580	10839 2418	12955 2526	13814 2683	11131 2499	1331/ 261	14214 4 2787	4 1142 7 257	7 1368 : 7 2699	14619 2892	11727 2654	14052 2784
.32.905 +1	137.3		+2	138.905			178.49		+4	180.948	8	+!	183.8		+4, +6	186.207	,	+4	190.23		+4	192.21	7	+3, +4	195.084	ı	+2, +4	196.967		+1, +3	200.592	2	+1, +2	204.383		+1, +3	207.2		+2, +4	208.98		+3, +5	209.0		-2, +2, +	210.0	0	-1, +	222.0		
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Marie Sklodowska Curie

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Ce		58	Pr	5	9	Nd		60	Pm		61	Sm		62	Eu		63	Gd		64	Tb		65	Dy		66	Но	(7	Er	68	Tm		69	Yb		70	Lu		
ceri	um		prase	odymiun	n	neod	lymiu	m	pror	methi	um	sa	m <mark>ari</mark> ur	n	eu	ı <mark>ropi</mark> uı	m	ga	d <mark>olini</mark> u	m	te	rbium		dys	prosiu	ım	ho	lmium		erbiu	ım	t	nulium	1	ytt	erbiun	n	lut	tetium	
6548 5 6164 5 5723 4	5361 5262 1839 884	39256 5274 6055 5614 902 +3, +4	41991 6835 6440 5964 929 140.908	5593 5 5492 6 5035 5 927	749 5498 5325 849 946 8, +4 1	43569 7126 6722 6208 980 44.242	37361 5829 5719 5228 979	42272 5723 6602 6088 1002 +3	45184 7428 7013 6459 1027 145.0	38725 6071 5961 5432 1023	43827 5957 6893 6339 1048	46834 7737 7312 6716 1083 150.36	40118 6317 6201 5633 1078	45414 6196 7183 6587 1106	48519 8052 7617 6977 1128 151.96	41542 6571 6458 5850 1122	47038 6438 7484 6844 1153 +2, +3	50239 8376 7930 7243 1190 157.25	42996 6832 6708 6053 1181	48695 6688 7787 7100 1213 +3	51996 8708 8252 7514 1241 158.925	7097 6975 6273 1233	50385 6940 8102 7364 1269 +3, +4	53789 9046 8581 7790 1292 162.5	45999 7370 7248 6498 1284	52113 7204 8427 7636 1325	55618 9394 8918 8071 1351 164.93	47547 53 7653 7 7526 8 6720 7 1342 1	877 (471 (758 911 (383 +3	57486 491 9751 79 9264 78 8358 69 1409 14	28 5567 39 774 311 909 49 819 404 144	59390 10116 9617 0 8648 1468 3 168.934	50742 8231 8102 7180 1463	57505 8026 9442 8472 1510 +3	61332 10486 9978 8944 1528 173.045	52388 8536 8402 7416 1526	59382 8313 9787 8753 1574 +3	63314 10870 10349 9244 1589 174.967	54070 63 8846 8710 1 7655 1580	
Th		90	Pa	g)1	U		92	Np		93	Pu		94	Am		95	Cm		96	Bk		97	Cf		98	Es	g	9	Fm	100	Md		101	No		102	Lr	1	
thori			prota	protactinium		uranium			neptunium		ım	plutonium		n	americiu		um		curium		berkeliu		n	californiu		m	eins	einsteinium		fermi	fermium		delevi	delevium		nobelium		lawr	lawrencium	
19693 163 16300 129	6426 6202	15642 18981 15588 3149	21105	13291 15	5104 9571 990 3240	21757	17454 17220 13614 3164	111303 16575 20170 16388 3340	118669 22427 21600 17610 3664 237.048	101059 17992 17751 13946 3250	17061 20784 16794 3435	121791 23104 22266 18057 3775 239.052	103734 18541 18296 14282 3339	17557 21420 17211 3534	124982 23808 22952 18510 3890 243.0	19110 18856 14620 3429	120284 18069 22072 17630 3635 +3, +4, +5	128241 24526 23651 18970 4009 247.0	109271 19688 19427 14961 3525	123403 18589 22735 18054 3740	131556 25256 24371 19435 4127 247.0	20280 20018 15308 3616	126580 19118 23416 18480 3842 +3, +4	134939 26010 25108 19907 4247 251.0	20894 20624 15660 3709	129823 19665 24117 18916 3946														