Slides Condensed Matter Physics Lecture 19

Green = Filled Shell Atoms L=S=0.

Red = half-filled minus one such that L=S and J=L-S=0.

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hydrogen	ř.																	helium
1																		2
l H																		He
1.0079 lithium	BREASONALISATION												boron		nitrogen	oxygen	fluorine	4.0026 neon
3	4												5	6	7	8	9	10
1.3	Da												D	0	N	0	F	Ne
LI	Be												В		IN	U	_	150:023150150150:0315015
6.941	9.0122												10.811	izoitt Silicon	14.007	15.999	18.998	20.180
sodium 11	magnesium 12												aluminiun 13	14	phosphorus 15	sulfur 16	chlorine 17	argon 18
	1001100000000110000															349	(5)(5)	
Na	Mg												Al	Si	Р	S	CI	Ar
22.990	24.305												26.982	28.086	30.974	32.065	35.453	39.948
potassium	calcium		scandium	titanium	vanadium	chromium	manganese	iron	cobalt	nickel	copper	20	gallium	germanium	arsenic	selenium	bromine	krypton
19	20		21	22	23	24	25	_26	27	28	29	30	31	32	33	34	35	36
K	Ca		Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
39.098	40.078		44.956	47.867	50.942	51.996	54.938	55.845	58.933	58.693	63.546	65.39	69.723	72.61	74.922	78.96	79.904	83.80
rubidium	strontium		yttrium	zirconium	niobium	molybdenum	technetium	ruthenium	rhodium	- Hadina	silver	cadmium	indium	lin lin	antimony	tellurium	iodine	xenon
37	38		39	40	41	42	43	_44	45	46	47	48	49	50	51	_52	53	54
Rb	Sr		Υ	Zr	Nb	Мо	Tc	Ru	Rh	Pd	Ag	Cd	ln	Sn	Sb	Te		Xe
85.468	87.62		88.906	91.224	92.906		[98]	101.07	102.91	108.49	107.87	112.41	114.82	10,72	121.76	127.60	126.90	131.29
caesium	barium		lutetium	hafnium	tantalum	tungsten	rhenium	osmium	iridium	praunum	gold	mercury	thallium	lead	bismuth	polonium	astatine	radon
55	56	57-70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs	Ba	*	Lu	Hf	Ta	W	Re	Os	lr	Pt	Au	Hg	TI	Po	Bi	Po	At	Rn
132.91	137.33	1	174.97	178.49	180.95	183,84	186.21	190.23	192.22	195.08	196.97	200.59	204.38	247.2	208.98	[209]	[210]	
francium	radium	02/2012/2021	lawrencium	rutherfordium	dubnium	seaborgium	bohrium	hassium	meitnerium	ununnilium	unununiun	ununbium		ununquadium		38400	3 3811-7511 - 5	
87	88	89-102	103	104	105	106	107	108	109	110	111	112		114				
Fr	Ra	* *	Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uuk		Uije				
[223]			[262]	[261]	[262]		[264]	[269]	[268]	[271]	[272]							
N			701 170 1		10 M		10 TO 10		100	0.000	o m ve		di .					

*Lanthanide series

* * Actinide series

	lanthanum 57	cerium 58	praseodymium 59	neodymium 60	promethium 61	Samanum 62	europium 63	gadolinium 64	terbium 65	dysprosium 66	holmium 67	erbium 68	thulium 69	70
	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Yb
-	138.91	140.12	140.91	144.24	[145]	150.361	151.96	157.25	158.93	162.50	164.93	167.26	168.93	173.04
-[actinium	thorium	protactinium	uranium	neptunium	plutonium	americium	curium	berkelium	californium	einsteinium	fermium	mendeleviur	nobelium
- 1	89	90	91	92	93	94	95	96	97	98	99	100	101	102
	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No
ı	[227]	232.04	231.04	238.03	[237]		[243]	[247]	[247]	[251]	[252]	[257]	[258]	HAMMINININININININI

List of J=0 atoms.