

MATTER & MINERALS

CHEMISTRY HOMEWORK - WEEK 9 - FALL

Chapter 7

H $1s^1$

He $1s^2$

Li $1s^2 2s^1$

Be $1s^2 2s^2$

B $1s^2 2s^2 2p^1$

C $1s^2 2s^2 2p^2$

N $1s^2 2s^2 2p^3$

O $1s^2 2s^2 2p^4$

F $1s^2 2s^2 2p^5$

Ne $1s^2 2s^2 2p^6$

Na $1s^2 2s^2 2p^6 3s^1$

Mg $1s^2 2s^2 2p^6 3s^2$

Al $1s^2 2s^2 2p^6 3s^2 3p^1$

Si $1s^2 2s^2 2p^6 3s^2 3p^2$

P $1s^2 2s^2 2p^6 3s^2 3p^3$

S $1s^2 2s^2 2p^6 3s^2 3p^4$

Cl $1s^2 2s^2 2p^6 3s^2 3p^5$

Ar $1s^2 2s^2 2p^6 3s^2 3p^6$

K $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

Ca $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

	Sc	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$
	Ti	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$
	V	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$
*	Cr	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
	Mn	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$
	Fe	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
	Co	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$
	Ni	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$
*	Cu	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$
	Zn	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$
	Ga	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1$
	Ge	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$
	As	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$
	Se	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$
	Br	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$
	Kr	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$

61. $n = 1, 2, 3, 4, \dots$

$$l = 0, 1, 2, 3, \dots (n-1)$$

$$m_l = -l, -l+1, \dots, 0, \dots, +l$$

62. $1p, 3f, 2d$

63. (a) correct
 (b) incorrect $n=1, l=0, m_l=0$
 (c) correct
 (d) incorrect $n=1, l=0, m_l=0$

65. ψ^2 represents the electron density at a particular point in an atomic orbital (also known as the probability of finding an \bar{e} at a given point).

70. (a) n cannot be equal to zero!

(b) one electron

	m_l	# orbitals	# of \bar{e}
(c) $n=3, l=0$	0	1	2
	1, -1, 0, +1	3	6
	2, -2, -1, 0, +1, +2	5	10
			<u>18</u>
		total # of \bar{e} =	<u>18</u>

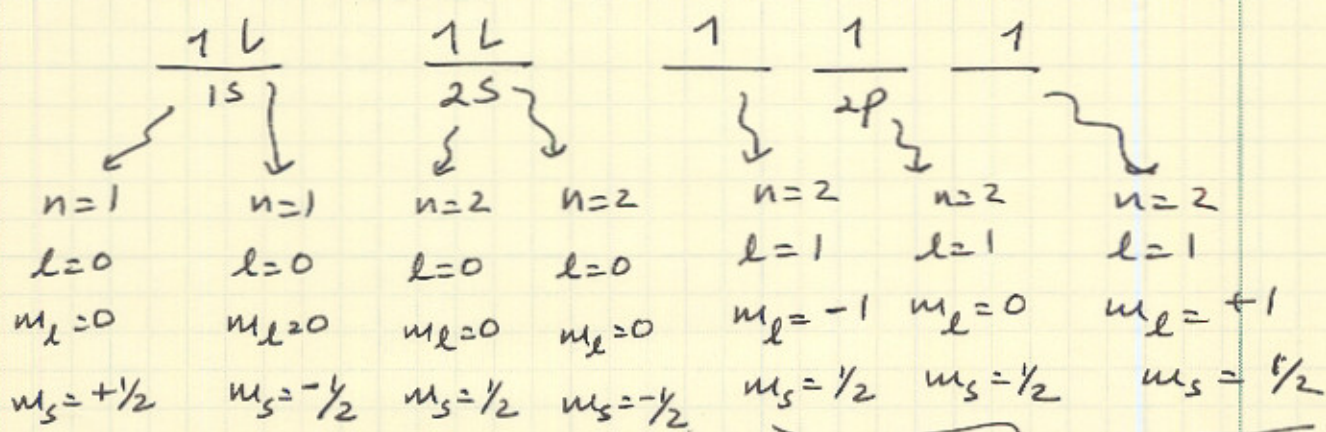
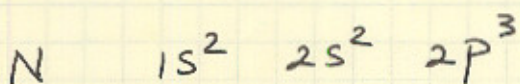
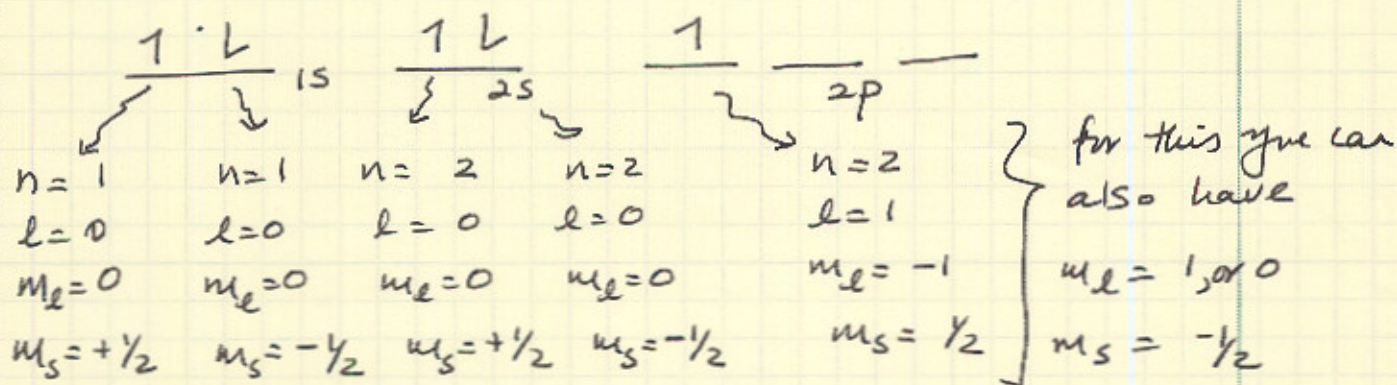
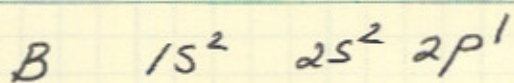
18 \bar{e} can have $n=3$

(d) $n=2, l=2$ there is no such orbital!

5 orbitals \Rightarrow 10 electrons

(e) $n=1, l=0, m_l=0$ two electrons

79.

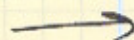


You can either write
 $m_s = 1/2$ OR $m_s = -1/2$ for
 all 3 of them.

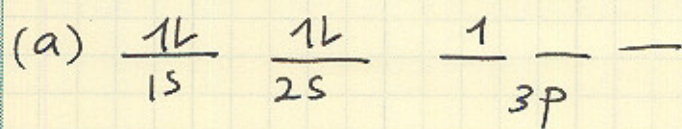
82. (a) excited state

Ground state would be $1s^2 2s^2 2p^1$

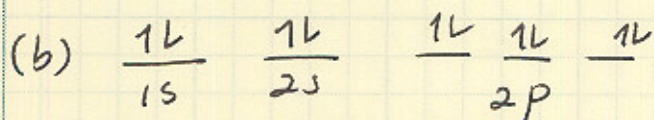
(b) ground state

(c) excited state. Ground state is $1s^2 2s^2 2p^5$ (d) excited state. Ground state is $[Ar] 4s^2 3d^6$ 

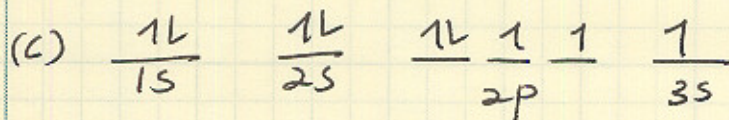
of unpaired e⁻



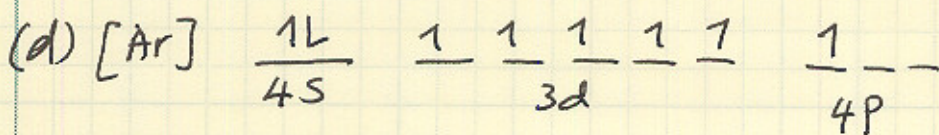
1



0



3



6