

Chemistry 1110 Fall 2002 Test 3

1) 5.75×10^{-5} cm

2) 3.55×10^{-20} J

3) 2.17×10^{28}

4) 6

5) 16

6)

n	l	m_l	m_s	Reason (if impossible)
2	2	0	$-\frac{1}{2}$	l must be less than n
3	2	$+\frac{1}{2}$	$+\frac{1}{2}$	m_l must be an integer

7)

a) 40,000

b) 6

c) 12

d) 0

8)

atom or ion	<i>full</i> ground state electron configuration	# of unpaired electrons
Zn	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$	0
Cr^{+1}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$	5
Fe^{+2}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$	4
La^{+3}	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$.0

9)

radius:	O, F, Cl	F O Cl
radius:	Ca ²⁺ , Cl ⁻ , Ar	Ca ⁺² Ar Cl ⁻
1 st IP:	Kr, Cl, O	Kr Cl O
2 nd IP:	Na, Mg, Ca	Ca Mg Na
EA:	Cl, F, Ne	Ne Cl F
Paramagnetic:	Cr, N, F	F N Cr
Metallic:	Cs, V, Ga	Ga V Cs
Bond strength:	C-C, C-O, C-N	C-C C-N C-O
Bond length:	C-I, C-O, C≡C	C≡C C-O C-I

10)

Molecule	Lewis Structure	Shape (name)
H_2CO		trigonal planar
PF_3		trigonal pyramidal
ICl_3		"T" (distorted)
ClO_2^-		bent

