Announcements - Lecture VIII - Thursday, Sep 29th

- 1. Exam I Thursday, October 6th In Class
- 2. Second Lab Saturday, October 1st ... 1-4pm ... ISB 155/160 (A-E)

a) Print lab prior to coming to lab -- use the 'Print Friendly Version' located on the top left hand side of the page – this is the version that contains the 'Data Sheet' that you will hand in upon completing the lab.

b) First set of Lab Owls will appear in Owl after this lab. There are a total of 4 sets of Lab Owls and they are worth <u>25% of the Lab</u> <u>Grade.</u>



iClicker:

Choose any letter: A-E



2.6		Hov	v Are	e the	Elec	tro	ns in	an Atom Arranged?			
				Drb	ital Bo	c Ele	ectror	Configurations Works	heet.	(4)	
Gp		#e	1s	2s	2p	3s	3р	Electronic Configuration	Noble Gas	Valence	Lewis Dot
1A	н	1	↑					<u> </u> 5'	ls'	1	н•
8A	He	2 ([)					ls²	\5 ²	2	He
								a			
1A	Li	3		┢				3 <mark>15¹25'</mark>	[He] 25'		Li•
2A	Be	4						15 ² 25 ²	[He]252	2	Be
3A	в	5							[He] 25 ² 2p1	3	В
4A	с	62						15 ² 25 ² 2p2	[He] 2522p2	ų	C
5A	Ν	7						15 ² 25 ² 29 ³	[He] 2522p3	5	N
6A	0	8						15 25° 2P4	[He] 252 2P4	6	0
7A	F	9						15 ² 25 ² 2p ⁵	[He]2522P5	Г	F
8A	Ne	10							[He] 2522p6	8	Ne

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2.6		Ho	w Aı	re tl	ne Elec	ctro	ons in	an Atom Arranged?			
						E	ectron	Configurations Works	heet.		
Gp		#e	1s	2s	2p	3s	3p	Electronic Configuration	Noble Gas	Valence	Lewis Dot
1A	Na	11			NNN	↑		15 25 20 35'	[Ne] 3s'	1	Na•
2A	Mg	12		N				15125120 352	[Ne] 352	2	Mg
3A	AI	13			NNN			15225226 352 3pl	[Ne] 352 3P1	3	AI
4A	Si	14		₽	NNN		$\uparrow \uparrow$	15 25 2P 35 3P2	[Ne] 35 ² 3p ²	ц	Si
5A	Ρ	15					$\uparrow \uparrow \uparrow$	<mark>\s`2\$`2?[°]35` 3p³</mark>	[Ne] 35° 3P ³	5	P
6A	s	16			NNN			15252p 352 3p4	[Ne]35 ² 39 ⁴	6	S
7A	CI	17		\mathbb{N}		N		-15-25-29 ⁶ 35- 39 ⁵	[Ne] 35 ² 39 ⁵	٦	CI
8A	Ar	18			NNN	N			[Ne]3523P6	8	Ar

2.6 H	ow Are the Elect	trons in an Atom Arranged?
()	Pauli :	Maximum of two electrons per orkital.
(2)	Humd :	Orkitals on the same level are filled singly first,
		then they are pained up.
3	Noble Gas Electrons	
		in any chemistry under normal circumstances.
(f)	Valence Electrons:	For Main Group elements the total number of electrons
		occupying the highest n valued or latals.
		occupying the highest n valued or kitals. $\Rightarrow I : IKr] 55^2 4d^{10}5p^5 7 Valence electrons$
		✓ X ✓
		b b b b c

.6			the El n Meta		ns in	an At	om A	rrange	∋d?	4s 4p
										$3p = 6$ $3p = 6$ $18e^{-} = [Ar]$ $2p = 6$ Orbital Stainway
21 Sc Scandium 44.9559	22 Ti ^{Titanium} 47.88	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.9380	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	2p = 0rbital Stairway $2s \frac{\lambda}{1s \frac{\lambda}{2s}}$
								See d	ass he	eb site to check on these predictions
	21	Sc :	EAr]45 ² 3	9,				/	•
	22	Ti :	EAr] 45 3	12					
	23	N :	EAr] 45° 3	d ³					
	24	Cr:	C Br] 45°3	d4				X	actual : [Ar] 45'3d5
	25	Mn :	- CA	-] 45²3	92 (7 Pred	icted	,	(
	26	Fe	Eð	r] 45²3	qe			•	/	
	27	: <mark>م</mark>	[A	r] 45 ² 3	47			V	/	
	28	Nı:	LU	r] 45 ² 3	48			•		
	29	Cu :	[A	r]45°3	⁹ bd					actual : [Ar] 45' 3d'0
	30	Zn :	EA	r]45 ² 3	d ¹⁰			••••••		

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2.	6	Ho	w A	re t	he Eleo	ctro	ons in ai	n Atom Arranged?			
1A	Li	3	↑↓	↑				<mark>1s²</mark> 2s ¹	[He]2s ¹	1	ы.
2A	Be	4	↑↓	↑↓				1s ² 2s ²	[He]2s ²	2	Be ;
ЗA	в	5	↑↓	↑↓	↑ I			<mark>1s²</mark> 2s²2p¹	[He]2s ² 2p ¹	3	Ŕ;
4A	с	6	↑↓	↑↓	\uparrow \uparrow			<mark>1s²</mark> 2s²2p²	[He]2s ² 2p ²	4	·ċ:
5A	Ν	7	↑↓	↑↓	$\uparrow \uparrow \uparrow$			<mark>1s²</mark> 2s²2p³	[He]2s ² 2p ³	5	·Ņ:
6A	0	8	↑↓	↑↓	↑↓ ↑ ↑			<mark>1s²</mark> 2s²2p⁴	[He]2s ² 2p ⁴	6	-ö:
7A	F	9	↑↓	↑↓	↑↓ ↑↓ ↑			<mark>1s²</mark> 2s²2p⁵	[He]2s ² 2p ⁵	7	iř.
8A	Ne	10	↑↓	↑↓	↑↓ ↑↓ ↑↓			<mark>1s²</mark> 2s²2p ⁶	[He]2s ² 2p ⁶	8	:Ne:
				а <u>н</u> а							h.
1A	Na	11	↑↓	↑↓	↑↓ ↑↓ ↑↓	î		<mark>1s²2s²2p⁶3s¹</mark>	[Ne] 3s ¹	1	Na-
2A	Mg	12	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓		<mark>1s²2s²2p⁶3s²</mark>	[Ne] 3s ²	2	Mg
ЗA	AI	13	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	Ŷ	<mark>1s²2s²2p⁶3s²3p¹</mark>	[Ne] 3s ² 3p ¹	3	AÌ;
4A	Si	14	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑ ↑	<mark>1s²2s²2p⁶3s²3p²</mark>	[Ne] 3s ² 3p ²	4	·si:
5A	Ρ	15	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	\uparrow \uparrow \uparrow	<mark>1s²2s²2p</mark> ⁶ 3s²3p³	[Ne] 3s ² 3p ³	5	• •
6A	s	16	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑ ↑	<mark>1s²2s²2p</mark> ⁶ 3s²3p ⁴	[Ne] 3s ² 3p ⁴	6	-\$1
7A	СІ	17	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑↓ ↑	<mark>1s²2s²2p⁶3s²3p⁵</mark>	[Ne] 35 ² 3p ⁵	7	ដោ
8A	Ar	18	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑↓ ↑↓	<mark>1s²2s²2p</mark> 63s²3p6	[Ne] 3s ² 3p ⁶	8	: 茶 :

2.7 Electronic Configuration and Position in the Periodic Table

			Electron Configuration	Noble Gas	Valence		
1A	Li	3	<mark>1s²</mark> 2s¹	[He]2s ¹	1	4	
2A	Be	4	1s ² 2s ²	[He]2s ²	2		
3A	в	5	<mark>1s²</mark> 2s²2p1	[He]2s ² 2p ¹	3		
4A	с	6	<mark>1s²</mark> 2s²2p²	[He]2s ² 2p ²	4		GROUP 1A +1
5A	N	7	<mark>1s²</mark> 2s²2p³	[He]2s ² 2p ³	5		GROUP 2A +2
6A	0	8	<mark>1s²</mark> 2s²2p⁴	[He]2s ² 2p ⁴	6		
7A	F	9	<mark>1s²</mark> 2s²2p ⁵	[He]2s ² 2p ⁵	7	<	
8A	Ne	10	1s²2s²2p°	[He]2s ² 2p ⁶	8		
			· · · ·				
1A	Na	11	1s ² 2s ² 2p ⁶ 3s ¹	[Ne] 3s ¹	1	4	
2A	Mg	12	<mark>1s²2s²2p°</mark> 3s²	[Ne] 3s ²	2	<u> </u>	
ЗA	AI	13	<mark>1s²2s²2p⁶3s²3p¹</mark>	[Ne] 3s ² 3p ¹	3		
4A	Si	14	<mark>1s²2s²2p°</mark> 3s²3p²	[Ne] 3s ² 3p ²	4		
5A	Ρ	15	<mark>1s²2s²2p</mark> ⁶ 3s²3p³	[Ne] 3s ² 3p ³	5		
6A	s	16	<mark>1s²2s²2p⁶</mark> 3s²3p ⁴	[Ne] 3s ² 3p ⁴	6		
7A	CI	17	<mark>1s²2s²2p⁶</mark> 3s²3p ⁵	[Ne] 3s ² 3p ⁵	7		-
8A	Ar	18	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶	[Ne] 3s ² 3p ⁶	8		

2.7 Electronic Configuration and Periodic Blocks

