## Announcements - Lecture VIII - Thursday, Sep 29th

- 1. Exam I Thursday, October 6<sup>th</sup> In Class
- 2. Second Lab Saturday, October 1<sup>st</sup> ... 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 <sup>2</sup>	2	He
								<b>a</b>			
1A	Li	3		┢				3 <mark>15<sup>1</sup>25'</mark>	[He] 25'		Li•
2A	Be	4						15 <sup>2</sup> 25 <sup>2</sup>	[He]252	2	Be
3A	в	5							[He] 25 <sup>2</sup> 2p1	3	В
4A	с	62						15 <sup>2</sup> 25 <sup>2</sup> 2p2	[He] 2522p2	ų	C
5A	Ν	7						15 <sup>2</sup> 25 <sup>2</sup> 29 <sup>3</sup>	[He] 2522p3	5	N
6A	0	8						15 25° 2P4	[He] 252 2P4	6	0
7A	F	9						15 <sup>2</sup> 25 <sup>2</sup> 2p <sup>5</sup>	[He]2522P5	Г	F
8A	Ne	10							[He] 2522p6	8	Ne

**Slide - 62** 

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 <sup>2</sup> 3p <sup>2</sup>	ц	Si
5A	Ρ	15					$\uparrow \uparrow \uparrow$	<mark>\s`2\$`2?<sup>°</sup>35` 3p<sup>3</sup></mark>	[Ne] 35° 3P <sup>3</sup>	5	P
6A	s	16			NNN			15252p 352 3p4	[Ne]35 <sup>2</sup> 39 <sup>4</sup>	6	S
7A	CI	17		$\mathbb{N}$		N		-15-25-29 <sup>6</sup> 35- 39 <sup>5</sup>	[Ne] 35 <sup>2</sup> 39 <sup>5</sup>	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 <sup>Titanium</sup> 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 <b>Ni</b> 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 <sup>2</sup> 3	9,				/	•
	22	Ti :	EAr	] 45 3	12					
	23	<b>N</b> :	EAr	] 45° 3	d <sup>3</sup>					
	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 <sup>2</sup> 3	47			V	/	
	28	Nı:	LU	r] 45 <sup>2</sup> 3	48			•		
	29	Cu :	[A	r]45°3	<sup>9</sup> bd					actual : [Ar] 45' 3d'0
	30	Zn :	EA	r]45 <sup>2</sup> 3	d <sup>10</sup>			••••••		

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**Slide - 66** 

2.	6	Ho	w A	re t	he Eleo	ctro	ons in ai	n Atom Arranged?			
1A	Li	3	↑↓	↑				<mark>1s²</mark> 2s <sup>1</sup>	[He]2s <sup>1</sup>	1	ы.
2A	Be	4	↑↓	↑↓				1s <sup>2</sup> 2s <sup>2</sup>	[He]2s <sup>2</sup>	2	Be ;
ЗA	в	5	↑↓	↑↓	↑ I			<mark>1s²</mark> 2s²2p¹	[He]2s <sup>2</sup> 2p <sup>1</sup>	3	Ŕ;
4A	с	6	↑↓	↑↓	$\uparrow$ $\uparrow$			<mark>1s²</mark> 2s²2p²	[He]2s <sup>2</sup> 2p <sup>2</sup>	4	·ċ:
5A	Ν	7	↑↓	↑↓	$\uparrow \uparrow \uparrow$			<mark>1s²</mark> 2s²2p³	[He]2s <sup>2</sup> 2p <sup>3</sup>	5	·Ņ:
6A	0	8	↑↓	↑↓	↑↓ ↑ ↑			<mark>1s²</mark> 2s²2p⁴	[He]2s <sup>2</sup> 2p <sup>4</sup>	6	-ö:
7A	F	9	↑↓	↑↓	↑↓ ↑↓ ↑			<mark>1s²</mark> 2s²2p⁵	[He]2s <sup>2</sup> 2p <sup>5</sup>	7	iř.
8A	Ne	10	↑↓	↑↓	↑↓ ↑↓ ↑↓			<mark>1s²</mark> 2s²2p <sup>6</sup>	[He]2s <sup>2</sup> 2p <sup>6</sup>	8	:Ne:
				а <u>н</u> а							h.
1A	Na	11	↑↓	↑↓	↑↓ ↑↓ ↑↓	î		<mark>1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>1</sup></mark>	[Ne] 3s <sup>1</sup>	1	Na-
2A	Mg	12	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓		<mark>1s²2s²2p<sup>6</sup>3s²</mark>	[Ne] 3s <sup>2</sup>	2	Mg
ЗA	AI	13	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	Ŷ	<mark>1s²2s²2p<sup>6</sup>3s²3p¹</mark>	[Ne] 3s <sup>2</sup> 3p <sup>1</sup>	3	AÌ;
4A	Si	14	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑ ↑	<mark>1s²2s²2p<sup>6</sup>3s²3p²</mark>	[Ne] 3s <sup>2</sup> 3p <sup>2</sup>	4	·si:
5A	Ρ	15	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	$\uparrow$ $\uparrow$ $\uparrow$	<mark>1s²2s²2p</mark> <sup>6</sup> 3s²3p³	[Ne] 3s <sup>2</sup> 3p <sup>3</sup>	5	• •
6A	s	16	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑ ↑	<mark>1s²2s²2p</mark> <sup>6</sup> 3s²3p <sup>4</sup>	[Ne] 3s <sup>2</sup> 3p <sup>4</sup>	6	-\$1
7A	СІ	17	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑↓ ↑	<mark>1s²2s²2p<sup>6</sup>3s²3p<sup>5</sup></mark>	[Ne] 35 <sup>2</sup> 3p <sup>5</sup>	7	ដោ
8A	Ar	18	↑↓	↑↓	↑↓ ↑↓ ↑↓	↑↓	↑↓ ↑↓ ↑↓	<mark>1s²2s²2p</mark> 63s²3p6	[Ne] 3s <sup>2</sup> 3p <sup>6</sup>	8	: <b>茶</b> :

## 2.7 Electronic Configuration and Position in the Periodic Table

			Electron Configuration	Noble Gas	Valence		
1A	Li	3	<mark>1s²</mark> 2s¹	[He]2s <sup>1</sup>	1	4	
2A	Be	4	1s <sup>2</sup> 2s <sup>2</sup>	[He]2s <sup>2</sup>	2		
3A	в	5	<mark>1s²</mark> 2s²2p1	[He]2s <sup>2</sup> 2p <sup>1</sup>	3		
4A	с	6	<mark>1s²</mark> 2s²2p²	[He]2s <sup>2</sup> 2p <sup>2</sup>	4		GROUP 1A +1
5A	N	7	<mark>1s²</mark> 2s²2p³	[He]2s <sup>2</sup> 2p <sup>3</sup>	5		GROUP 2A +2
6A	0	8	<mark>1s²</mark> 2s²2p⁴	[He]2s <sup>2</sup> 2p <sup>4</sup>	6		
7A	F	9	<mark>1s²</mark> 2s²2p <sup>5</sup>	[He]2s <sup>2</sup> 2p <sup>5</sup>	7	<	
8A	Ne	10	1s²2s²2p°	[He]2s <sup>2</sup> 2p <sup>6</sup>	8		
			· · · ·				
1A	Na	11	1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> 3s <sup>1</sup>	[Ne] 3s <sup>1</sup>	1	4	
2A	Mg	12	<mark>1s²2s²2p°</mark> 3s²	[Ne] 3s <sup>2</sup>	2	<u> </u>	
ЗA	AI	13	<mark>1s²2s²2p<sup>6</sup>3s²3p¹</mark>	[Ne] 3s <sup>2</sup> 3p <sup>1</sup>	3		
4A	Si	14	<mark>1s²2s²2p°</mark> 3s²3p²	[Ne] 3s <sup>2</sup> 3p <sup>2</sup>	4		
5A	Ρ	15	<mark>1s²2s²2p</mark> <sup>6</sup> 3s²3p³	[Ne] 3s <sup>2</sup> 3p <sup>3</sup>	5		
6A	s	16	<mark>1s²2s²2p<sup>6</sup></mark> 3s²3p <sup>4</sup>	[Ne] 3s <sup>2</sup> 3p <sup>4</sup>	6		
7A	CI	17	<mark>1s²2s²2p<sup>6</sup></mark> 3s²3p <sup>5</sup>	[Ne] 3s <sup>2</sup> 3p <sup>5</sup>	7		-
8A	Ar	18	1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> 3s <sup>2</sup> 3p <sup>6</sup>	[Ne] 3s <sup>2</sup> 3p <sup>6</sup>	8		

### 2.7 Electronic Configuration and Periodic Blocks

