Announcements - Lecture VIII - Thursday, Oct 1st

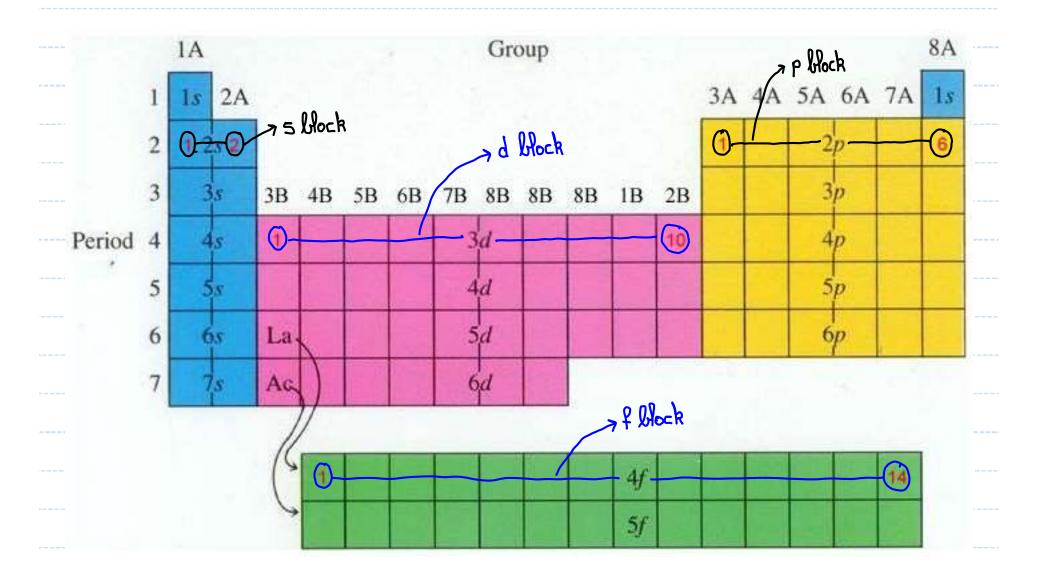
- 1. Exam I Tuesday, October 6th In Class
- 2. Second Lab Saturday, October 3rd ... 1-4pm ... ISB 155/160 (A-E)
 - a) Print lab prior to coming to lab -- use the 'Print Friendly Version' located on the top left hand side of the page this is the version that contains the 'Data Sheet' that you will hand 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 25% of the Lab Grade.
- 3. iClicker: Choose any letter: A-E



2.7 Electronic Configuration and Position in the Periodic Table

			Electron Configuration	Noble Gas	Valence	20	
 1 <i>A</i>	Li	3	1s ² 2s ¹	[He]2s ^I	1	4	
 2A	Be	4	1s ² 2s ²	[He]2s²	2		7
 3 <i>A</i>	В	5	1s ² 2s ² 2p ¹	[He]2s²2p¹	3		
 4A	C	6	1s ² 2s ² 2p ²	[He]2s²2p²	4		GROUP IA +1
5 <i>A</i>	Ν	7	1s ² 2s ² 2p ³	[He]2s ² 2p ³	5		GROUP 2A +2
6A	0	8	1s ² 2s ² 2p ⁴	[He]2s²2p⁴	6		
 7A	F	9	1s ² 2s ² 2p ⁵	[He]2s ² 2p ⁵	7		
 8.4	Ne	10	1s ² 2s ² 2p ⁶	[He]2s ² 2p ⁶	8		
				Mh	A.A.		
 1 <i>A</i>	Na	11	1s ² 2s ² 2p ⁶ 3s ¹	[Ne] 3s1	1	4	
 2A	Mg	12	1s ² 2s ² 2p ⁶ 3s ²	[Ne] 3s ²	2	-	GROUP 7A1
3 <i>A</i>	Al	13	1s ² 2s ² 2p ⁶ 3s ² 3p ¹	[Ne] 3s²3p¹	3		
4 <i>A</i>	Si	14	1s ² 2s ² 2p ⁶ 3s ² 3p ²	[Ne] 3s ² 3p ²	4		
 5A	P	15	1s ² 2s ² 2p ⁶ 3s ² 3p ³	[Ne] 3s ² 3p ³	5		
 6 <i>A</i>	s	16	1s ² 2s ² 2p ⁶ 3s ² 3p ⁴	[Ne] 3s ² 3p ⁴	6	<u> </u>	
 7A	CI	17	1s ² 2s ² 2p ⁶ 3s ² 3p ⁵	[Ne] 3s ² 3p ⁵	7	-	
 8.4	Ar	18	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶	[Ne] 3s ² 3p ⁶	8	<u> </u>	

2.7 Electronic Configuration and Periodic Blocks



What Is a Periodic Property 2.8 **Atomic Size** 10 Li Be B Ne 2 Beryllium Lithium Nitrogen Oxygen Boron Carbon Fluorine Neon 10.811 6.941 9.0122 12.011 14.0067 15,9994 18,9984 20.1797 11 Decreasing size. Na Sodium Snollest 22,9898 Imcreasing size. > outermost electron Largest Nucleus **Slide - 70**

2.8 Periodic Properties

A Atomic Size

Arrange the following elements in order of increasing size, by ranking them 1 (smallest) to 5 (largest).

 $\frac{1}{2}$ O $\frac{5}{2}$ Mg $\frac{2}{2}$ C $\frac{3}{2}$ Si $\frac{4}{2}$ Al

4.0026 6 C 8 3 5 10 В N Li Be Ne F Lithium Beryllium Boron Carbon Nitrogen Fluorine Neon Oxygen 6.941 9.0122 10.811 12.011 14.0067 15.9994 18.9984 20.1797 12 13 14 11 15 16 17 18 Mg Al Si P Cl Na S Ar Magnesium Aluminum Silicon Chlorine Sodium Phosphorus Sulfur Argon 24.3050 28.0855 22.9898 26.9815 30.9738 32.066 35.4527 39.948 19 20 31 32 34 35 36 33 K Kr Ca Ga Ge As Se Br Calcium Selenium Potassium Gallium Germanium Arsenic Bromine Krypton 39.0983 40.078 69.723 72.61 74.9216 78.96 79.904 83.80 37 38 49 50 51 52 53 54 Rb Sr Sn Sb Te I Xe In Rubidium Strontium Indium Tin Antimony Tellurium Iodine Xenon 118,710 121.757 131.29 85,4678 87.62 114.82 127.60 126.9045

Which element did you rank as 2?

a) 0

b) Mg

d) Si

e) Al



He Helium

Snallest

01

2.8 Periodic Properties

B Ionization Energy

2	3 Li Lithium 6.941	Be Beryllium 9.0122	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	10 Ne Neon 20.1797
 3	11 Na Sodium 22.9898	l '		m of am a	equired to or ion.	Romove	the outern	105t

How easy is it to Romove the outermost electron? ... Depends on how strongly it is held ... How is this related to size?



- 2.8 Periodic Properties
- **B** Ionization Energy

Arrange the following elements in order of increasing ionization energy, by ranking them 1 (smallest) to 4 (largest).

4 C

2 AI

<u>3</u> Si

He

Helium 4.0026 6 C 10 Li В N O Be F Ne Lithium Beryllium Carbon Neon Boron Nitrogen Oxygen Fluorine 6.941 9.0122 10.811 12.011 14.0067 15.9994 18.9984 20.1797 13 14 18 11 16 12 15 17 Al Si P S Na Mg Cl Ar Magnesium Silicon Sodium Aluminum Phosphorus Sulfur Chlorine Argon 28,0855 22,9898 24.3050 26.9815 30,9738 32,066 35,4527 39.948 31 32 34 36 19 20 33 35 K Kr Ca Ga Ge AsSe Br Gallium Potassium Calcium Germanium Arsenic Selenium Bromine Krypton 39.0983 40.078 69.723 72.61 74.9216 78.96 79.904 83.80 38 49 50 52 54 37 51 53 Rb Sr Sn Te Xe Sb In Rubidium Tellurium Strontium Indium Tin Antimony Iodine Xenon 85.4678 87.62 114.82 118.710 121.757 127.60 126,9045 131.29

largest IE

Go 1 <u>C</u>

Which element did you rank as 3?

a) C

b) Ga

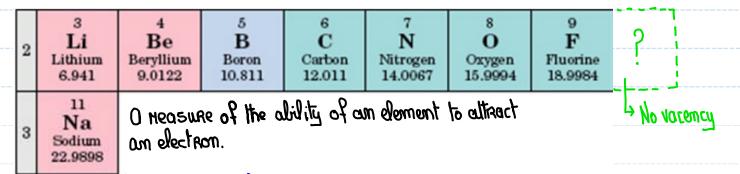
c) Al

d) Si 🗸



2.8 Periodic Properties

C Electronegativity



Where would am electron prefer to reside? ... How is this related to size?



a) Ca

b) S **√**

c) P

d) As

Which of the above has the greatest electronegativity?



							He Helium 4.0026	
3 Li Lithium 6.941	Be Beryllium 9.0122	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	10 Ne Neon 20.1797	C 1 2
11 Na Sodium 22.9898	Mg Mg Magnesium 24.3050	13 Al Aluminum 26.9815	14 Si Silicon 28.0855	Phosphorus 30.9738	16 S Sulfur 32.066	17 Cl Chlorine 35.4527	18 Ar Argon 39.948	
19 K Potassium 39.0983	Calcium 40.078	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.9216	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80	
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	49 In Indium 114.82	50 Sn Tin 118.710	51 Sb Antimony 121.757	Te Te Tellurium 127.60	53 I Iodine 126.9045	54 Xe Xenon 131.29	