

Honors Chemistry Unit 2 – Periodic Table Notes

Periodic Table History

What did each of these scientists do?

1. Lavoisier (____)

2. Newlands (____)

3. Mendeleev (____)

4. Moseley (____)

Periodic Law:

Organization of the Periodic Table

1. Groups

1 H 1.0079																	2 He 4.0026	
3 Li 6.941	4 Be 9.0122											5 B 10.811	6 C 12.011	7 N 14.007	8 O 15.999	9 F 18.998	10 Ne 20.180	
11 Na 22.990	12 Mg 24.305	3	4	5	6	7	8	9	10	11	12	13 Al 26.982	14 Si 28.086	15 P 30.974	16 S 32.065	17 Cl 35.453	18 Ar 39.948	
19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.887	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.845	27 Co 58.933	28 Ni 58.693	29 Cu 63.546	30 Zn 65.38	31 Ga 69.723	32 Ge 72.64	33 As 74.922	34 Se 78.96	35 Br 79.904	36 Kr 83.798	
37 Rb 85.468	38 Sr 87.62	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29	
55 Cs 132.91	56 Ba 137.33	57-71 #	72 Hf 178.49	73 Ta 180.95	74 W 183.84	75 Re 186.21	76 Os 190.13	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.39	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)	
87 Fr (223)	88 Ra (226)	89-103 #	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (271)	111 Rg (272)	112 Uub (285)	113 Uut (284)	114 Uuq (289)	115 Uup (288)				
		* Lanthanide series		92 La 138.91	93 Ce 140.12	94 Pr 140.91	95 Nd 144.24	96 Pm (145)	97 Sm 150.36	98 Eu 151.96	99 Gd 157.25	100 Tb 158.93	101 Dy 162.50	102 Ho 164.93	103 Er 167.26	104 Tm 168.93	105 Yb 173.04	106 Lu 174.97
		# Actinide series		88 Ac (227)	89 Th 232.04	90 Pa 231.04	91 U 238.03	92 Np (237)	93 Pu (244)	94 Am (243)	95 Cm (247)	96 Bk (247)	97 Cf (251)	98 Es (252)	99 Fm (257)	100 Md (258)	101 No (259)	102 Lr (262)

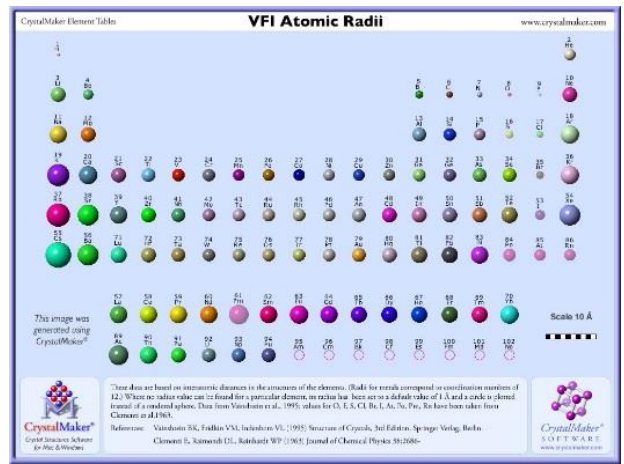
2. Periods

Groups/Families

Group/Family	Characteristics	Location on the PT
Alkali Metals		
Alkaline Earth Metals		
Transition Metals		
Halogens		
Chalcogens		
Noble Gases		
Lanthanides		
Actinides		
Metals		
Non-metals		
Metalloids		

Periodic Trends

1. Atomic Radius



a. Let's try it! What has the largest atomic radius: carbon, fluorine, beryllium, or lithium?

b. Which has the largest radius: Mg, Si, S, Na?

2. Ionic Radius

a. Which substance is larger? Calcium or calcide ion?

b. Which substance is larger? Fluorine or fluoride ion?

3. Electronegativity

1																	18		
1	2											13	14	15	16	17	18		
H	He											B	C	N	O	F	Ne		
1.020	2.200											2.041	2.201	2.201	2.447	2.447	2.200		
3	4											5	6	7	8	9	10		
Li	Be											Al	Si	P	S	Cl	Ar		
0.978	1.037											1.611	1.904	2.190	2.190	2.300	2.200		
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
0.923	0.901	1.611	1.904	2.190	2.190	2.300	2.200	0.854	0.854	1.040	1.310	1.520	1.820	2.160	2.500	2.690	2.690	2.540	2.380
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Ba	La
0.895	0.895	1.037	1.310	1.520	1.820	2.160	2.500	2.690	2.690	2.540	2.380	2.200	2.060	1.900	1.790	1.600	1.550	0.895	1.037
87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106
Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr			
(2.20)	(2.20)	1.037	1.310	1.520	1.820	2.160	2.500	2.690	2.690	2.540	2.380	2.200	2.060	1.900	1.790	1.600	1.550	0.895	1.037

* Ionization potential (eV)

Electronegativity (Pauling)

a. Rank the following elements by increasing electronegativity: oxygen, sulfur, neon, aluminum

4. Ionization Energy

1																	18					
1 H 1.0079																	13	14	15	16	17	18 He 4.0026
2 Li 5.391	4 Be 9.0024															5 B 8.0113	6 C 11.011	7 N 14.007	8 O 13.999	9 F 18.999	10 Ne 21.018	
11 Na 4.959	12 Mg 7.377	3	4	5	6	7	8	9	10	11	12	13 Al 5.786	14 Si 8.446	15 P 10.486	16 S 10.002	17 Cl 12.512	18 Ar 15.207					
19 K 4.189	20 Ca 5.904	21 Sc 4.835	22 Ti 6.581	23 V 5.513	24 Cr 7.461	25 Mn 7.427	26 Fe 7.646	27 Co 7.732	28 Ni 7.639	29 Cu 7.727	30 Zn 7.834	31 Ga 7.829	32 Ge 7.901	33 As 8.079	34 Se 8.158	35 Br 8.015	36 Kr 8.991					
37 Rb 4.082	38 Sr 5.495	39 Y 4.575	40 Zr 6.631	41 Nb 5.563	42 Mo 7.384	43 Tc 7.28	44 Ru 7.471	45 Rh 7.461	46 Pd 7.504	47 Ag 7.571	48 Cd 7.681	49 In 7.666	50 Sn 7.845	51 Sb 8.015	52 Te 8.101	53 I 8.101	54 Xe 8.991					
55 Cs 3.757	56 Ba 5.212	57 La 5.581	58 Ce 5.541	59 Pr 5.491	60 Nd 5.441	61 Pm 5.441	62 Sm 5.441	63 Eu 5.441	64 Gd 5.441	65 Tb 5.441	66 Dy 5.441	67 Ho 5.441	68 Er 5.441	69 Tm 5.441	70 Yb 5.441	71 Lu 5.441						
87 Fr 3.441	88 Ra 5.101	89 Ac 5.101	90 Th 5.101	91 Pa 5.101	92 U 5.101	93 Np 5.101	94 Pu 5.101	95 Am 5.101	96 Cm 5.101	97 Bk 5.101	98 Cf 5.101	99 Es 5.101	100 Fm 5.101	101 Md 5.101	102 No 5.101	103 Lr 5.101						

5. Reactivity – Metals

1																	18					
1 H 1.0079																	13	14	15	16	17	18 He 4.0026
2 Li 5.391	4 Be 9.0024															5 B 8.0113	6 C 11.011	7 N 14.007	8 O 13.999	9 F 18.999	10 Ne 21.018	
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19 K 4.189	20 Ca 5.904	21 Sc 4.835	22 Ti 6.581	23 V 5.513	24 Cr 7.461	25 Mn 7.427	26 Fe 7.646	27 Co 7.732	28 Ni 7.639	29 Cu 7.727	30 Zn 7.834	31 Ga 7.829	32 Ge 7.901	33 As 8.079	34 Se 8.158	35 Br 8.015	36 Kr 8.991					
37 Rb 4.082	38 Sr 5.495	39 Y 4.575	40 Zr 6.631	41 Nb 5.563	42 Mo 7.384	43 Tc 7.28	44 Ru 7.471	45 Rh 7.461	46 Pd 7.504	47 Ag 7.571	48 Cd 7.681	49 In 7.666	50 Sn 7.845	51 Sb 8.015	52 Te 8.101	53 I 8.101	54 Xe 8.991					
55 Cs 3.757	56 Ba 5.212	57 La 5.581	58 Ce 5.541	59 Pr 5.491	60 Nd 5.441	61 Pm 5.441	62 Sm 5.441	63 Eu 5.441	64 Gd 5.441	65 Tb 5.441	66 Dy 5.441	67 Ho 5.441	68 Er 5.441	69 Tm 5.441	70 Yb 5.441	71 Lu 5.441						
87 Fr 3.441	88 Ra 5.101	89 Ac 5.101	90 Th 5.101	91 Pa 5.101	92 U 5.101	93 Np 5.101	94 Pu 5.101	95 Am 5.101	96 Cm 5.101	97 Bk 5.101	98 Cf 5.101	99 Es 5.101	100 Fm 5.101	101 Md 5.101	102 No 5.101	103 Lr 5.101						

6. Reactivity – Nonmetals