Periodic Table Solitaire Lab: Periodic Trends - Part 2

Objectives

Which element properties are periodic?

Which element properties are not periodic?

What are the trends for the periodic properties as you move across periods and down groups of elements on the periodic table?

Procedure

Use the card arrangement below to answer the research questions.

520 6.9 XCI	0.16 X ₂ 0 453.7	9.0	0.11 XO 1560	÷		1086 12.0 XCl ₄	.077 XO ₂ 4100		.070 X ₂ O ₅ 63.14	1314 16.0 XCl ₂	.066 XO 50.35	19.0	.062 X ₂ O 53.48	20.2	0.13 24.55	<u>Key</u> Ionization Energy	Atomic Radius
0.53 0.98	XH	1.85 1.57	XH_2	2.34 2.04	XH3	2.62 2.55	XH4	1.25 3.04	XH ₃	1.4 3.44	XH_2	1.7 3.98	ХН	0.901	_	Atomic Mass	Oxide Formula
496 23.0 XCI	0.19 X ₂ O 371.0	24.3	0.16 XO 922	578 27.0 XCl ₂	0.14 X ₂ O ₃ 933.3	28.1	-	31.0	0.11 X ₂ O ₅ 317.3	1000 32.1 XCL	XO_2	1251 35.5 XC1	0.10 X ₂ O 172.2	39.9	0.17 	Chloride Formula	Melting Point
0.97 0.93		1.74 1.31	$\rm XH_2$	COLOR"		2.33 1.90	XH4	12100	XH3			3.17 3.16	XH	A COLORING		Density	Hydride Formula
419 39.1 XC1 0.86 0.82	0.24 X ₂ O 336.4 XH	40.1 XCl ₂		123.2	0.14 X ₂ O ₃ 302.9 XH ₃	XCI_4	0.12 XO ₂ 1210 XH ₄	74.9 XCl ₃	0.12 X ₂ O ₅ 1081 XH ₃	1.000	ssing nent"	1140 79.9 XCl 3.1 2.96	0.12 X ₂ O 265.9 XH	83.8	0.19 — 115.8 —	Electro- negativity	
403 85.5 XC1 1.53 0.80	0.25 X ₂ O 312.0 XH	87.6 XCl ₂	1041	114.8	0.17 X ₂ O ₃ 429.8 XH ₃	118.7 XCl ₄	1. TO 1. T	121.8 XCl ₃	0.14 X ₂ O ₅ 904 XH ₃	127.6			1.00	131.3 —	0.21 XO ₃ 161.4		

Data - Identify each element above, and write its atomic number and chemical symbol in the table below:

Data Analysis

Graph the 6 quantitative properties of the elements as a function of the elements' atomic numbers. Remember to number each graph, give it a descriptive title, and label the axes.

Conclusions

1. Which element properties are periodic? How did you know?

2. Which element properties are not periodic? How did you know?

3. What are the trends for the periodic properties as you move across periods and down groups of elements on the periodic table? Write increasing or decreasing above each arrow below to show how the property changes.

3 4 5 6 7 8 Na Mg Al Si P Si 11 12 13 14 15 b	F											-	gy	ener	on H	zati	Ioni	1	1 2
3 4 5 6 7 8 Na Mg 11 12 13 14 15 16		0.1															H		
Na Mg Al Si P Si 11 12 13 14 15 b	9	8	N 7							1									
		S 16															Na		
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 3	Br 35	Se 34	As 33	Ge 32	Ga 31	Zn 30	Св 29	Ni 28	Co 27	Fe 26	Mn 25	Cr 24	V 23	Ti 22	Sc 21	Ca	K 19		
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb T		Te 52					Ag 47						Nb						
Cs Ba Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi P	At 85	Po 84	Bi 83	Pb 82	T 81	Hg 80			It 77										
Fr Ra 87 88 104 105 106 107 108									109	108	107	106	105	104		Ra 88			