

Periodic Trends

ATOMIC RADIUS

1. What trend in atomic radius do you see as you go down a group/family on the periodic table?
2. What causes this trend?
3. What trend in atomic radius do you see as you go across a period/row on the periodic table?
4. What causes this trend?
5. Circle the atom in each pair that has the largest atomic radius.
 - a) Al B
 - b) S O
 - c) Br Cl
 - d) Na Al
 - e) O F
 - f) Mg Ca

6. Put the following elements in order from smallest to largest atomic radius **and** explain why:
C, O, Sn, Sr.

ELECTRONEGATIVITY

7. Define electronegativity
8. How does the ionic radius of a nonmetal compare with its atomic radius?
9. What trend in electronegativity do you see as you go down a group/family on the periodic table?
10. What causes this trend?
11. What trend in electronegativity do you see as you go across a period/row on the periodic table?
12. What causes this trend?
13. Circle the atom in each pair that has the greater electronegativity.
 - a) Ca Ga
 - b) Li O
 - c) Cl S
 - d) Br As
 - e) Ba Sr
 - f) O S

GENERAL QUESTIONS

14. Which group tends to form +1 ions? _____
15. Which group tends to form +2 ions? _____
16. Which group tends to form -1 ions? _____
17. Which group tends not to form ions or react? _____

18. Based on the concept of periodic trends, answer the following questions for these atoms: **Li, Be, Mg, Na**. Be able to defend your answers.

a. Which element has the lowest electronegativity? _____

b. Which element has the least metallic character? _____

c. Which element is the largest atom? _____

19. Based on the concept of periodic trends, answer the following questions for these atoms: **P, S, Cl, F**. Be prepared to defend your answers.

d. Which element has the highest electronegativity? _____

e. Which element has the least metallic character? _____

f. Which element has the largest ion? _____

20. Based on the concept of periodic trends, answer the following questions for these atoms: **Au, Zn, S, Si**. Be able to defend your answers.

a. Which element has the highest electronegativity? _____

b. Which element has the most metallic character? _____

c. Which element has the largest atom? _____

21. Complete the following chart:

	<i>K</i>	Mg	Ne	N	Cl	Si
Atomic #						
<i>Period</i>						
Group #						
Family name (if any)						
# of valence e⁻						
# protons						
Metal, nonmetal, or metalloid?						
Conducts electricity? (yes/no)						
State at room temperature?						
Ion Formed? (positive, negative, none, varies)						

22. _____ metal

23. _____ chlorine

24. _____ metalloid

25. _____ transition elements

26. _____ group 1

27. _____ noble gases

28. _____ group 2

b. metals with unpredictable properties

c. a halogen

d. make good semiconductors

e. alkali metals

f. has a full outer energy level (shell)

g. loses electrons in bonding

a. alkaline earth metals

Instructions Fill in the arrows below with the following terms: *increasing electronegativity, increasing metallic character, increasing atomic radius, increasing nonmetallic character, increasing reactivity, decreasing atomic radius*

hydrogen 1 H 1.0079																	helium 2 He 4.0026				
lithium 3 Li 6.941	beryllium 4 Be 9.0122															boron 5 B 10.81	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180
sodium 11 Na 22.990	magnesium 12 Mg 24.305															aluminum 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.867	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.38	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selenium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80				
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29					
caesium 55 Cs 132.91	barium 56 Ba 137.33	lanthanum 57 La [139]	cerium 58 Ce [140]	praseodymium 59 Pr [141]	neodymium 60 Nd [145]	promethium 61 Pm [145]	samarium 62 Sm [150]	europium 63 Eu [152]	gadolinium 64 Gd [157]	terbium 65 Tb [159]	dysprosium 66 Dy [163]	holmium 67 Ho [165]	erbium 68 Er [167]	thulium 69 Tm [169]	ytterbium 70 Yb [173]						
francium 87 Fr [223]	radium 88 Ra [226]	actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]						

Key:
 element name
 atomic number
 symbol
 atomic weight (mean relative mass)

*lanthanoids

**actinoids

