

The Periodic Table

Name:

1. The first periodic table of the elements and the original periodic law were proposed by?
2. How was the original periodic law different from the current periodic law?
3. What discovery allowed for the change in the periodic law?
4. What are the horizontal rows of the periodic table called?
5. The number of the period in the periodic table is the same as the _____ principal energy level containing electrons.
6. The vertical columns of the periodic table are known as _____ or _____.
7. Why do elements of the same group have similar chemical properties?
8. What is the general location of the metals in the periodic table? You can use a sketch if you want.
9. What name is given to the group 1 metals?
10. What name is given to the group 2 metals?
11. Which metal family contains the most reactive metals?
12. What are 5 physical and/or chemical properties of metals?
13. What is the general location of the nonmetals on the periodic table? You can use a sketch if you want.
14. What family contains the most reactive nonmetals?
15. What is the name given to family 16?
16. What are 5 physical and/or chemical properties of nonmetals?

17. Explain what a metalloid is.

18. Name 4 elements that are metalloids.

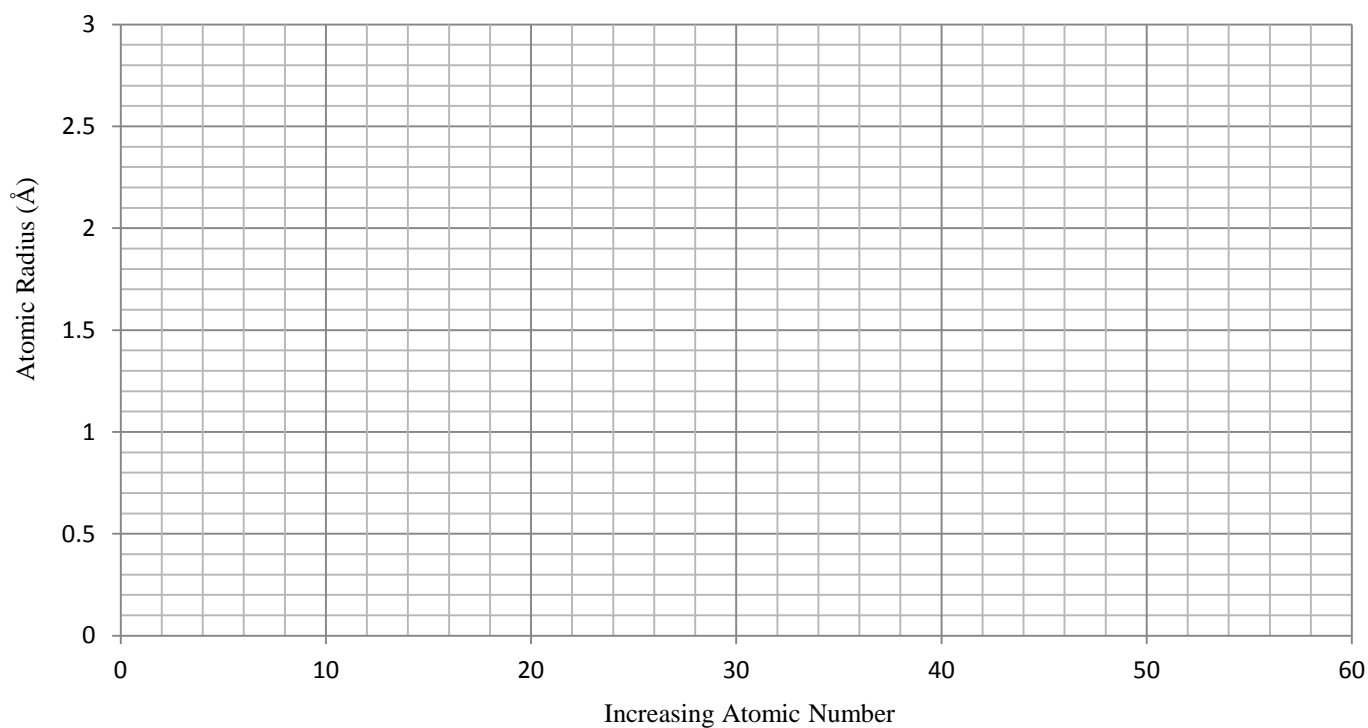
19. Describe the location of the transition metals on the periodic table. You can use a sketch if you want.

20. Explain how the radius of an atom is determined.

21. Plot the radii of the Alkali Metals on the chart below (all values are in angstroms (\AA), $1\text{\AA} = 1 \times 10^{-10}\text{m}$). You will plot the element by its atomic number, which you will have to look up:

Li = 1.52 \AA Na = 1.54 \AA K = 2.27 \AA Rb = 2.48 \AA Cs = 2.65 \AA

Alkali Metals Atomic Radii



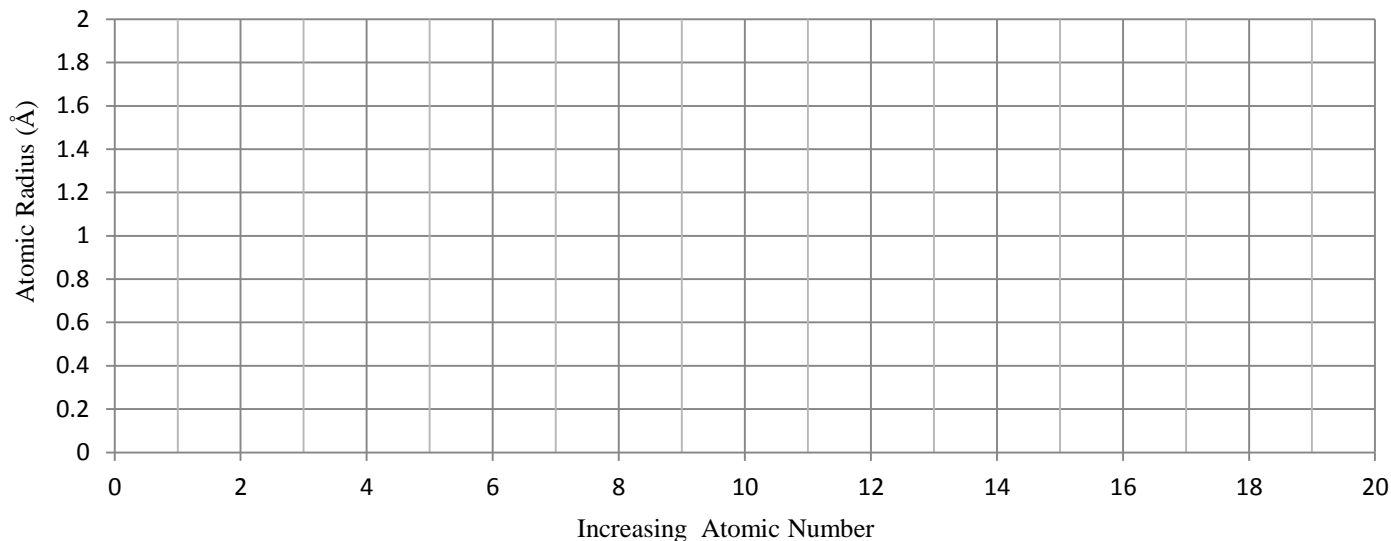
22. Describe the trend in atomic radius within a group by completing the following sentence: Within a group, as atomic number increases,

23. Explain why the trend in question 22 occurs.

24. Plot the covalent atomic radii of the atoms from period 3 in the chart below. All measurements are in angstroms. You will plot the element by its atomic number, which you will have to look up:

Na = 1.57 Mg = 1.36 Al = 1.25 Si = 1.17 P = 1.10 S = 1.04 Cl = 0.99

Period 3 Atomic Radii



25. Describe the trend in atomic radius within a period by completing the following sentence: Within a period, as atomic number increases,

26. Explain why the trend in question 25 occurs.

27. Arrange the following in ions order of decreasing (largest to smallest) ionic radii; S^{-2} , Ba^{+2} , Zn^{+2} , O^{-2} , Ca^{+2} , F^{-1}

28. How many electrons does each of the ions in question 27 have?

a. $S^{-2} =$

b. $Ba^{+2} =$

c. $Zn^{+2} =$

d. $O^{-2} =$

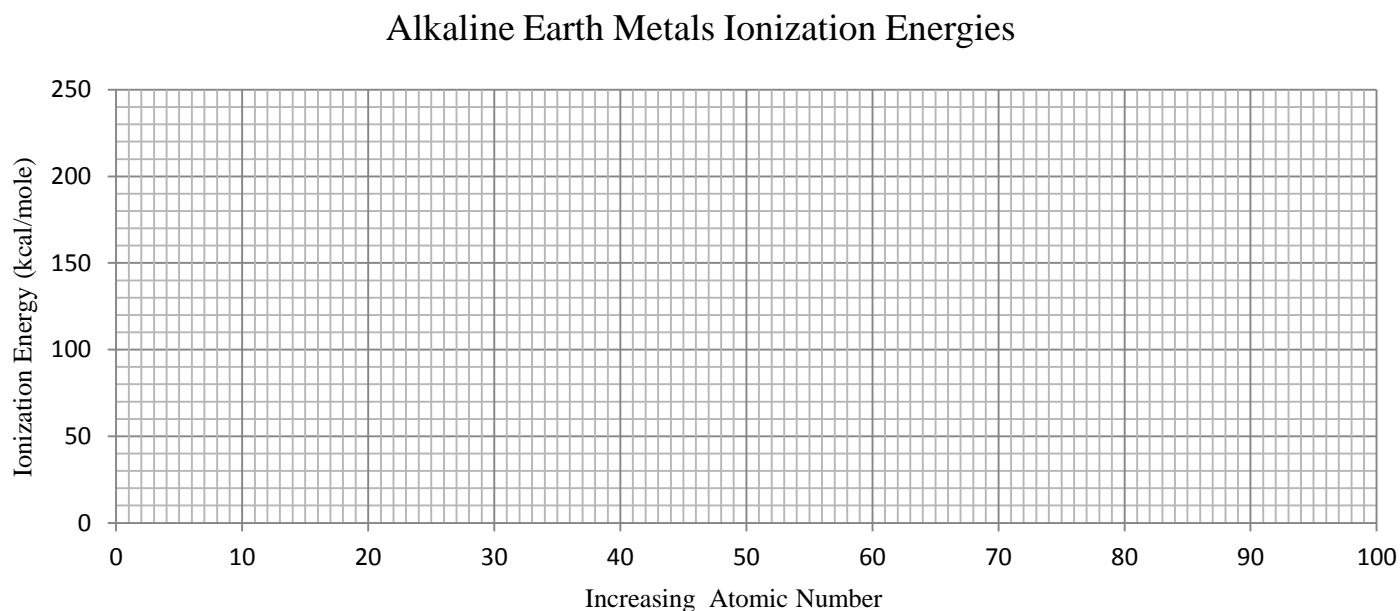
e. $Ca^{+2} =$

f. $F^{-1} =$

29. Define ionization energy.

30. Plot the ionization energies of the Alkaline Earth Metals on the chart below (all values are in kcal/mole):

Be = 215 Mg = 176 Ca = 141 Sr = 125 Ba = 121 Ra = 125



31. Describe the trend in ionization energy within a family by completing the following sentence: Within a family, as atomic number increases,

32. Explain why the trend in question 31 occurs.

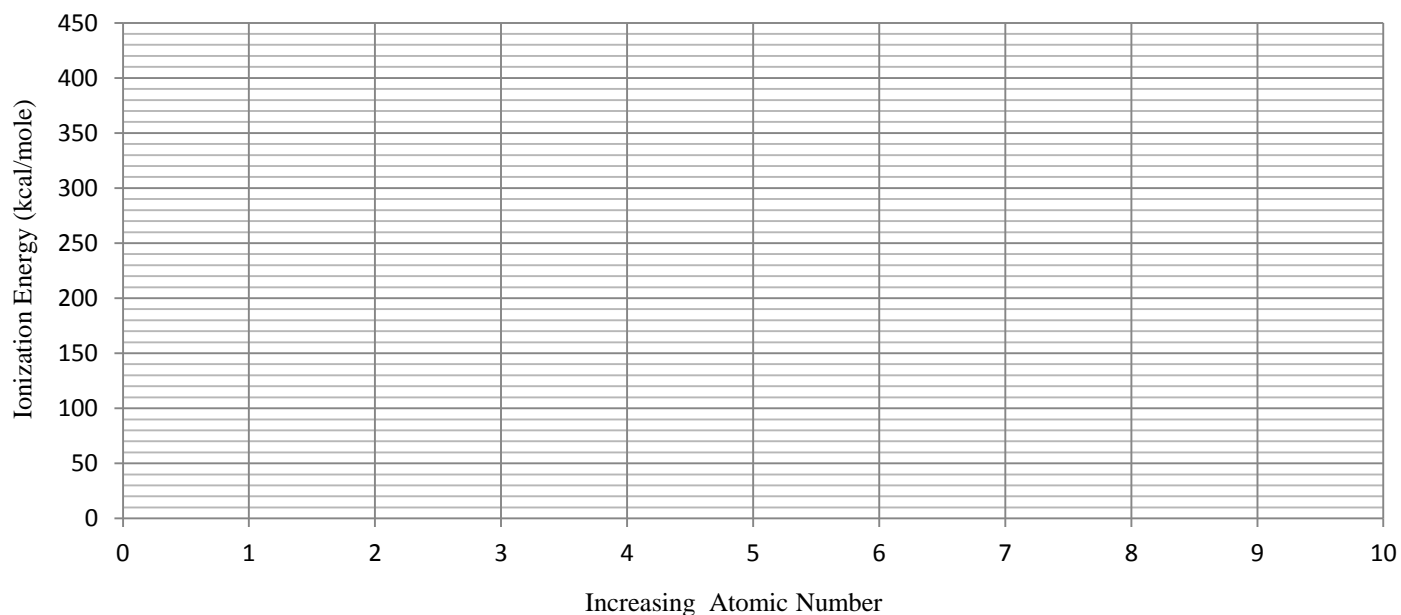
33. Define what the second ionization energy would be?

34. Will the second ionization energy for an element be higher or lower than the first ionization energy for an element?

35. Plot the ionization energies of the Period 2 elements on the chart below (all values are in kcal/mole):

Li = 125 Be = 215 B = 191 C = 260 N = 335 O = 314 F = 402

Period 2 Ionization Energies



36. Describe the trend in ionization energy within a period by completing the following sentence: Within a period, as atomic number increases,

37. Explain why the trend in question 36 occurs.

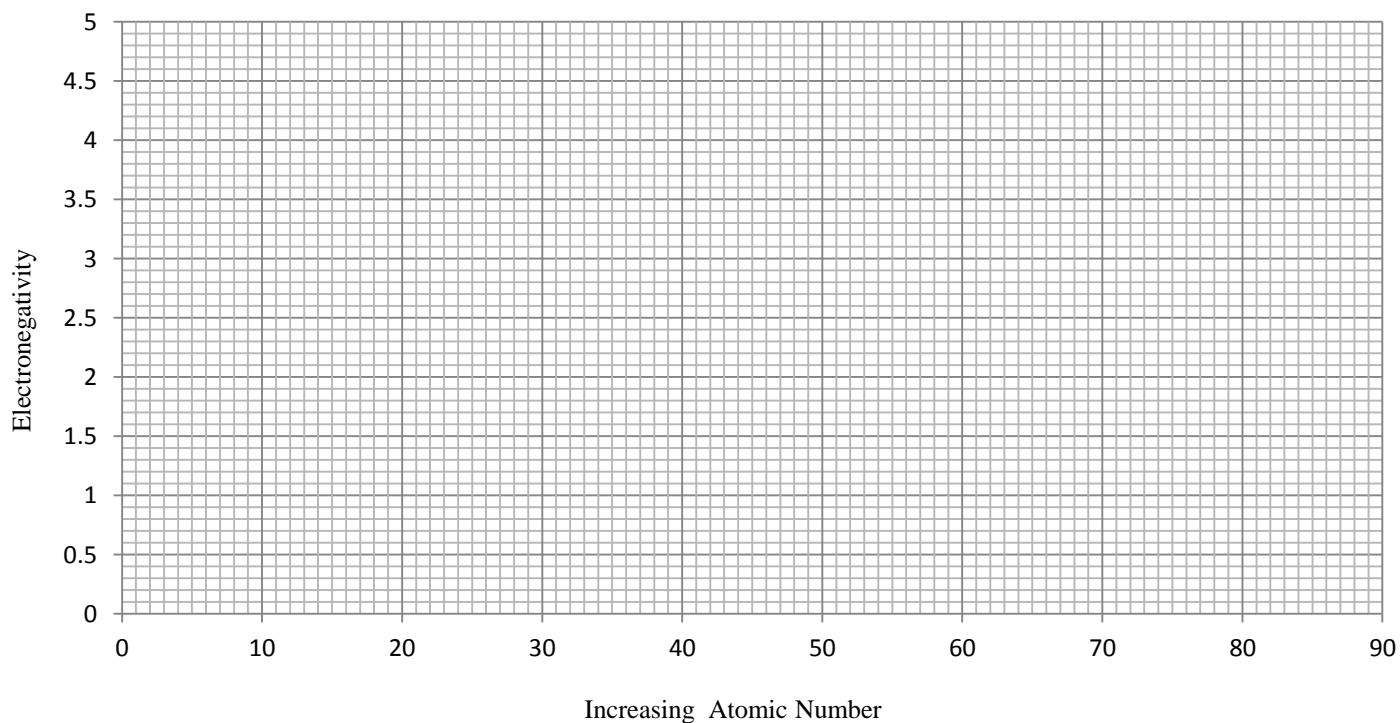
38. Arrange the following elements in order of increasing (smallest to largest) ionization energy; Si, Mg, N, P, Sr, Cs, F

39. Define Electronegativity.

40. Plot the electronegativities of the following halogens on the chart below:

F = 4.0 Cl = 3.2 Br = 2.9 I = 2.7 At = 2.2

Halogen Electronegativities



41. Describe the trend in electronegativity within the halogens by completing the following sentence:
Within a family, as atomic number increases,

42. Explain why the trend in question 41 occurs.

43. A metal forms a cation by (losing, gaining) _____ one or more electrons. When this happens, the radius (increase, decreases) _____.
44. A nonmetal forms an anion by (losing, gaining) _____ one or more electrons. When this happens, the radius (increase, decreases) _____.
45. Compare metals and nonmetals in terms of conductivity. Use complete sentences in your comparison.
46. Compare metals and nonmetals in terms of luster. Use complete sentences in your comparison.
47. Compare metals and nonmetals in terms of ionization energy. Use complete sentences in your comparison.
48. Compare metals and nonmetals in terms of electro negativity. Use complete sentences in your comparison.
49. What are the two most opposite elements on the periodic table?
50. Describe the trend in metallic character within a group.
51. Describe the trend in metallic character within a period.
52. Describe the trend in nonmetallic character within a group.
53. Explain how man made elements are created.