NAME: **HONORS CHEMISTRY**

SECTION: Periodic trends Mixed Practice

**After studying chapter 11.11, you should be able to:**

* Predict the chemical stability of atoms using the octet rule.
* Write electron configurations for ions.
* Explain exceptional electron configurations.
* Interpret the trend shown by atomic and ionic radii within the periodic table.
* Explain the variation in ionization energies within the periodic table.
* Interpret the trend shown by atomic sizes within the periodic table.
* Interpret the trend shown by electronegativities within the periodic table.
* Interpret the trend shown by electron affinity within the periodic table.
* State how many valence electrons are present in atoms of each main-group element.
* Draw Lewis dot diagrams for main-block elements.
* Predict common ions of elements.

Problems for you to try:

1. Write Lewis structures for the following elements:

1. oxygen
2. xenon
3. antimony
4. polonium
5. strontium
6. cesium
7. How does atomic size change with increasing atomic number within a period? Explain why, using atomic structure and coulombic attractions.
8. How does atomic size change with increasing atomic number within a group? Explain why, using atomic structure and coulombic attractions?
9. When metallic atoms lose electrons, how does the size of the ions formed compare with the size of the neutral atom?
10. When nonmetallic atoms gain electrons, how does the size of the ions formed compare with the size of the neutral atom?
11. Circle the larger particle in each of the following pairs.
12. Na, Li
13. Br, I
14. F, F-
15. Cs, Ba
16. K, K+
17. Ne, Ar
18. Given the electron configurations for the following neutral atoms, predict the charge of the ion each is most likely to form.
19. 1s2 2s2 2p6 3s2
20. 1s2 2s2 2p6 3s1
21. 1s2 2s2 2p6
22. 1s2 2s2 2p5
23. 1s2 2s2 2p1
    1. 8. Describe the period and group trends for ionization energy.
    2. 9. Circle the atom in each of the following pairs that has the lower first ionization energy.
24. Li, Na
25. Kr, Rb
26. Cs, Ba
27. Cl, Br
28. F, Ne
29. S, Cl
30. Explain why the actual electron configuration for silver does not follow the general guidelines of the Aufbau principle for predicting electron configurations.
    1. 11. In each of the following pairs, which element has the higher electronegativity?
31. Cl, F
32. C, N
33. Mg, Na
34. As, Ca
    1. 12. Why are incandescent light bulbs filled with argon?
35. One characteristic of transition metals is their ability to form different ions. What factors account for this?
36. Draw an electron configuration (using arrows and boxes) for the following ions:
    1. K+
    2. N3-
37. The elements in Groups 1 and 17 are found in nature only in compounds. In terms of their ionization energies, explain why this is true.
38. Complete the concept map with arrows and the words “high,” “low,” “metal” or “nonmetal”

ATTRACTION OF OUTERMOST ELECTRONS TO NUCLEUS

May be may be

High Due to Due to Low

Which causes Which causes

\_\_\_\_ couloumbic attraction to nucleus

\_\_\_\_ shielding

\_\_\_\_ couloumbic attraction to nucleus

\_\_\_\_ shielding

\_\_\_\_ atomic radii

\_\_\_\_ IE

\_\_\_\_\_ electronegativity

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\_\_\_\_ atomic radii

\_\_\_\_ IE

\_\_\_\_\_ electronegativity

Which is characteristic of \_\_\_\_\_\_\_\_\_\_\_\_\_ Which is characteristic of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_