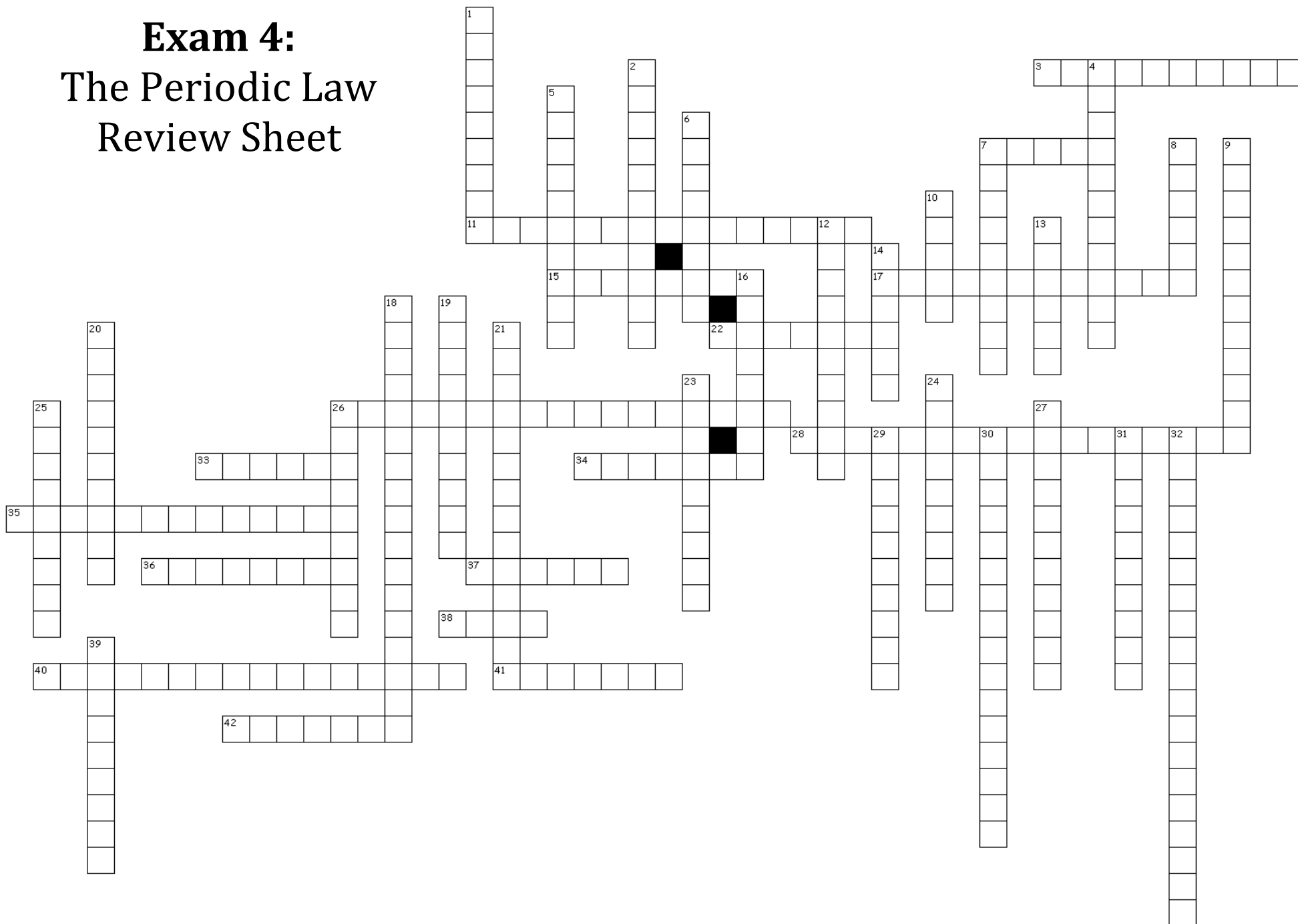


Exam 4: The Periodic Law Review Sheet



Name _____ Date _____ Mod _____ Exam Date _____

Across

3. unit used to measure ionization energy and electron affinity
7. stated that H was the fundamental element from which all others were composed
11. inner shell electrons block the nuclear pull on the valence electrons
15. suggested the Law of Octaves
17. half the distance between the nuclei of two chemically bonded atoms; the distance from the center of the nucleus to the "edge" of the electron cloud
22. developed an arbitrary scale for electronegativity that ranges from 0 to 4
26. a relative measure of how easily atoms lose or give up electrons
28. groups 3 – 12
33. product of an atom losing an electron; positively charged ion
34. atoms that are most metallic are the ____ elements as they are best at losing electrons
35. an arrangement of the elements in order of their atomic numbers so that elements with similar properties fall in the same column, or group
36. the most electronegative element on the periodic table with a value of 4
37. vertical columns on the periodic table; corresponds to the number of valence electrons in the main group elements
38. atoms that have gained or lost electrons and as a result have a charge
40. the energy change that occurs when an electron is acquired by a neutral gaseous atom
41. cations are always ____ than the neutral atom from which they were formed
42. rearranged the periodic table by atomic number

****Don't forget, there will also be two mole conversion problems on the exam.**

****Be sure to review through the list of element names and symbols that you are responsible for!**

Down

1. period 7 in between groups 3 & 4; represents the 5f sublevel; atomic numbers 89 - 103
2. the chemical and physical properties of the elements are a periodic function of their atomic number
4. period 6 in between groups 3 & 4; represents the 4f sublevel; atomic numbers 57 - 71
5. suggested the existence of triads in terms of properties of elements
6. group 17
7. in the group configurations, n is used to symbolize the ____ quantum number, indicating the distance of the valence shell from the nucleus; n corresponds to the period number and therefore the number of energy levels in an atom
8. shiny, malleable, ductile elements that are good conductors of heat and electricity; left of the stair-step line
9. group 1
10. product of an atom gaining an electron; negatively charged ion
12. developed a standard method for measuring the atomic masses of atoms
13. horizontal row on the periodic table; corresponds to the number of energy levels
14. anions are always ____ than the neutral atom from which they were formed
16. the most reactive nonmetals are the ____ since they are the best electron takers
18. a measure of the ability of an atom in a **chemical compound** to attract electrons
19. semiconducting elements that are shiny but brittle; on the stair-step line
20. any process that results in the formation of an ion
21. used to classify the arrangement of elements on the periodic table
23. all atoms want 8 valence electrons in order to be stable; except H & He which only need 2
24. elements in the s and p block
25. dull, brittle, insulating elements; right of the stair-step line
26. created the first periodic table in 1869 where elements were arranged by atomic mass
27. energy **added** to an atom results in this type of process
29. group 18
30. the minimum energy required to remove one electron from a neutral atom of an element
31. energy **released** from an atom results in this type of process
32. group 2
39. introduced letters to symbolize elements

B. Identify the periodicity for each item on the following table:

CHARACTERISTIC	GROUP TREND	PERIOD TREND
Atomic Radius		
Ionic Radius		
Ionization Energy		
Electron Affinity		
Shielding Effect		
Electronegativity		
Metallic Character		

C. For each valence configuration in the table identify each item:

VALENCE ELECTRON CONFIGURATION	BLOCK	PERIOD	GROUP	ELEMENT
$2s^2$				
$3s^23p^4$				
$4s^23d^2$				
$6s^25d^8$				
$5s^2$				
$4s^13d^5$				
$2s^22p^5$				

D. Write the valence configuration for the following elements:

ELEMENT	VALENCE CONFIGURATION
Tungsten (W)	
Sodium (Na)	
Antimony (Sb)	

E. List the charge on the ion most likely to be formed and the noble gas with the electron configuration thus achieved.

ELEMENT	CHARGE	NOBLE GAS NOTATION ACHIEVED
Chlorine (Cl)		
Oxygen (O)		
Barium (Ba)		
Potassium (K)		

F. Answer the following questions:

1. How does the size of a cation compare to the size of the neutral atom from which it was formed? Explain.

2. How does the size of an anion compare to the size of the neutral atom from which it was formed? Explain.

3. What happens to the electronegativity as you go down a group? Explain.

4. What happens to the size of the atom (atomic radius) as you move left to right across a period? Explain.