

Electron Configuration Practice

Name: _____

Chemistry

Due Date: _____

How to write an electron configuration:

- A. Determine the total number of electrons to be represented.
- B. Use the Aufbau principle to fill the orbitals with electrons for elements 1-23. Refer to electron configuration periodic table for elements after 23
- C. The sum of the superscripts should equal the total number of electrons. Example:
 $12\text{Mg } 1s^2 2s^2 2p^6 3s^2$

I. Configuration Writing Practice

A. Write a ground state electron configuration for each neutral atom. *Ground state means that all of the lowest possible energy levels (up to the proper number of electrons for the element) are filled.*

1. Na: _____

2. Pb: _____

3. Sr: _____

4. U: _____

5. N: _____

6. Ag: _____

7. Ti: _____

8. Ce: _____

9. Cl: _____

10. Hg: _____

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B. Write a ground state electron configuration for these ions. Remember that ions have a change in the total number of electrons (positive have lost electrons and negative have gained). Example: N^{3-} is $1s^2 2s^2 2p^6$. It has three extra electrons

11. O^{2-} : _____

12. Fe^{2+} : _____

13. B^{3+} : _____

14. Ni^{2+} : _____

15. K^+ : _____

16. Co^{3+} : _____

C. For the following electron configurations determine the possible elements (or ions) they may represent

17. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$: _____

18. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$: _____

19. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{10}$: _____

20. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$: _____

21. $[Kr] 5s^2 4d^{10} 5p^3$: _____

22. $[Ar] 4s^1$: _____

23. $[Xe] 6s^2 4f^{10}$: _____

24. $[Ne] 3s^2 3p^1$: _____

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D. Complete the following chart:

Element	Atomic Number	Number of e ⁻ in each E Level	Electron Configuration	Number of e ⁻ probably lost or gained	Number of e ⁻ left after loss or gain	Charge on Ion
O						
Na						
S						
K						
Al						
Cl						
Sr						
Ca						
F						
Br						
N						
I						

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E. In the space below, write the full (unabbreviated) electron configurations of the following elements:

1) sodium _____

2) iron _____

3) bromine _____

4) barium _____

5) neptunium _____

F. In the space below, write the Noble Gas (abbreviated) electron configurations of the following elements:

6) cobalt _____

7) silver _____

8) tellurium _____

9) radium _____

10) lawrencium _____

G. Determine what elements are denoted by the following electron configurations:

11) $1s^2 2s^2 2p^6 3s^2 3p^4$ _____

12) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ _____

13) $[\text{Kr}] 5s^2 4d^{10} 5p^3$ _____

14) $[\text{Xe}] 6s^2 4f^{14} 5d^6$ _____

15) $[\text{Rn}] 7s^2 5f^{11}$ _____

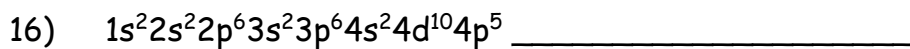
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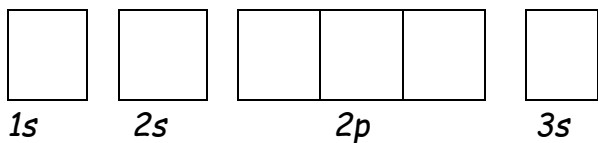
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H. Determine which of the following electron configurations are not valid: State which rule has been violated.

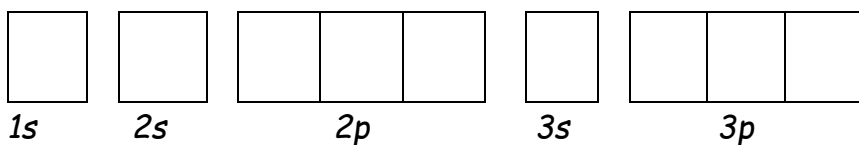


I. Write the full electron configuration, short-hand electron configuration, and fill in the orbital diagrams, for the following elements.

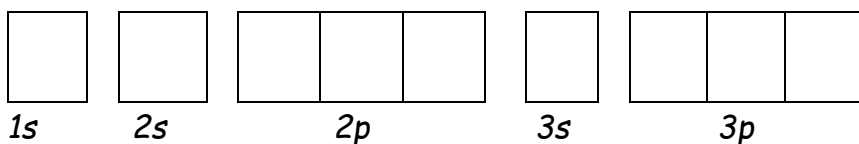
1. Nitrogen _____



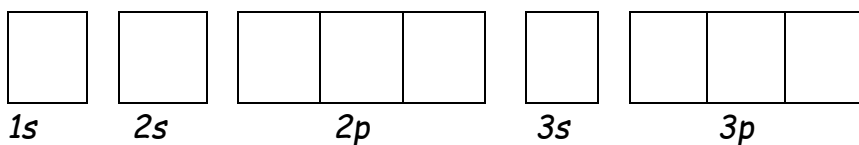
2. Chlorine _____



3. Sodium _____



4. Neon _____



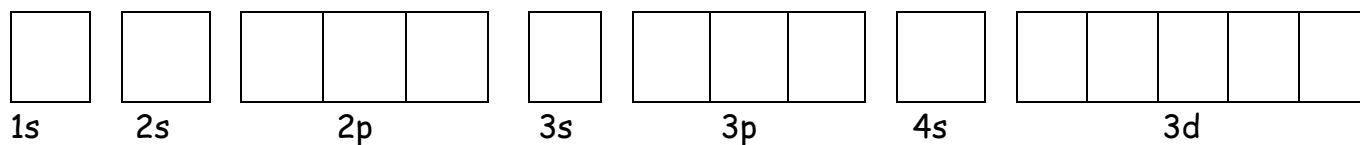
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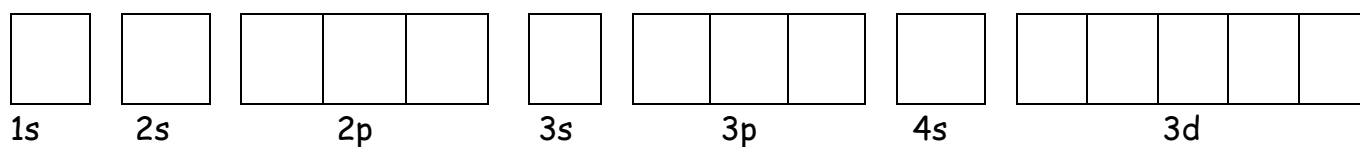
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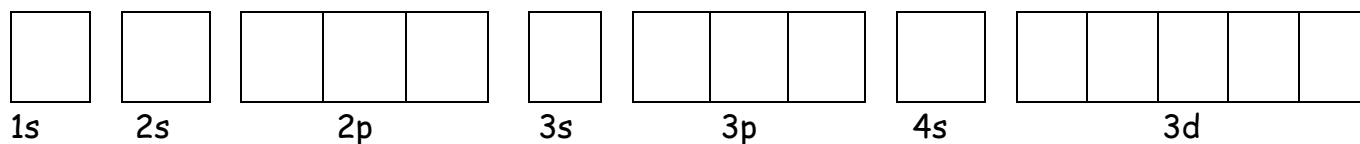
5. Nickel _____



6) Vanadium _____



7) Copper _____



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