

ELECTRON CONFIGURATIONS

EVIDENCE NOTEBOOK

KEY IDEAS

1. Electron Orbitals
 - a. Explain the difference between an orbit and an orbital:

 - b. List the four electron orbitals in order from lowest energy to highest energy:

2. S Orbitals
 - a. Diagram the shape of a s orbital:

 - b. How many electrons can a s orbital hold?

3. P Orbitals
 - a. Explain what is meant by the different orientations of the p orbital:

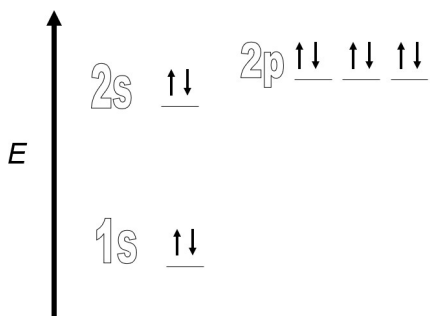
 - b. Explain how the different orientations relate to the number of electrons an orbital can hold:

 - c. What is the maximum number of electrons that can fit into a p orbital?

d. Illustrate what a p orbital looks like. Identify the different orientations in your diagram.

4. Like charges repel each other. Explain how two negatively charged electrons manage to stay in the same orbital with each other even though their charges repel each other:

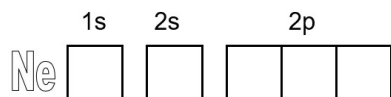
5. Below is an energy diagram for 10 electrons. Number each arrow to represent the order that they would be placed in:



6. Orbital Diagram

a. Write the *electron configuration* for **neon**:

b. Draw the orbital diagram (or sometimes referred to as an electron diagram) for neon. Number the arrows in the order that they should be placed in.



c. Define core electrons and give an example:

d. Define valence electrons and give an example:

7. Explain what the Aufbau Principle is:

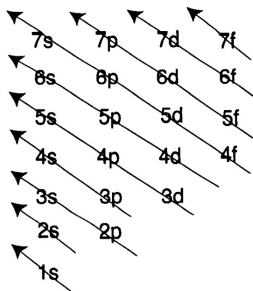
8. Explain what Hund's Rule is:

9. Draw the electron diagrams for the following elements:

| | 1s | 2s | 2p | | |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Boron | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Carbon | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Nitrogen | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Oxygen | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fluorine | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Neon | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Note: When you draw them yourself, make sure that the different orientations of an orbital are connected to each other. Notice that there are no gaps between the p-orientations.

10. How do you read the diagram below to write an electron configuration?



11. Write the electron configuration for zinc:

12. Periodic Table

a. Label the **blocks** of the periodic table:

| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | Og |

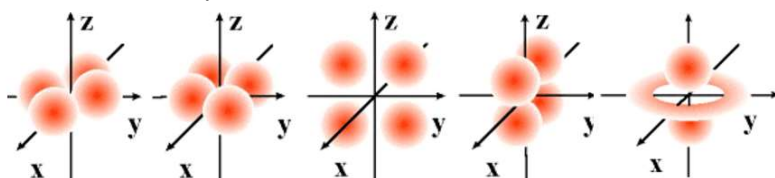
| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

b. How can you use the periodic table to write an electron configuration?

c. Write the electron configuration all the way up to oganesson (Og):

13. D Orbitals

a. How many d orientations are there?

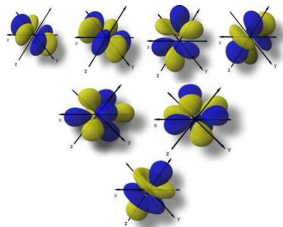


b. How many electrons fit in each orientation?

c. What is the maximum number of electrons that can fit in a d orbital?

14. F Orbitals

a. How many f orientations are there?



b. How many electrons fit in each orbital?

c. What is the maximum number of electrons that can fit in a f orbital?

15. Write the electron configuration for radon:

a. Step 1: Locate the element on the periodic table and identify how many electrons it has:

b. Write the configuration following the orbital energy levels:

CHECKPOINTS

Write the electron configurations for the following:

1. Carbon
2. Potassium
3. Nickel
4. Tungsten

NAME: _____ DATE: _____ PERIOD: _____

5. Radium

Write the electron diagrams for the following:

6. Lithium

7. Silicon

8. Iron

9. Tin

10. Gold