

electrons in class (Homework)

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1.

An atom in its lowest possible energy state is said to be in the _____ state.

2.

The number of sublevels in a principal energy level _____ as n increases.

3.

According to the Paulie exclusion principle, a given orbital can contain only _____ electrons.

4.

According to the Pauli exclusion principle, the electrons within a given orbital must have _____ spins.

5.

Which of the following orbital designations are possible? (Select all that apply.)

6.

Write the full electron configuration ($1s^22s^2$, etc.) for each of the following elements. (Type your answer using the format $1s^2 2s^2 2p^6$ for $1s^22s^22p^6$.)

(a) beryllium, $Z = 4$

(b) strontium, $Z = 38$

(c) bromine, $Z = 35$

(d) helium, $Z = 2$

7.

Using the symbol of the previous noble gas to indicate the core electrons, write the valence shell electron configuration for each of the following elements. (Type your answer using the format $[\text{Ne}] 3s^2 3p^4$ for $[\text{Ne}] 3s^2 3p^4$.)

(a) scandium, $Z = 21$

(b) zirconium, $Z = 40$

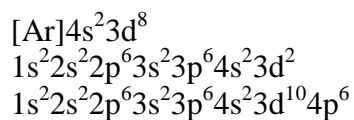
(c) bromine, $Z = 35$

(d) francium, $Z = 87$

8.

Identify the elements having the electron configurations below. Write the symbol for the element. You may use the Periodic Table.

$[\text{Ne}]3s^23p^2$



9.

How many valence electrons are found in an atom of Na?

10.

Which electron configuration represents an atom in an excited state?

11.

Which electron configuration cannot exist?

12.

Which subatomic particle(s) make(s) up most of the mass of an atom?

13.

Which orbital filling diagram is correct for the $2p$ subshell of nitrogen?

14.

How many orbitals are contained in the $3s$ sublevel?

15.

How many orbitals are contained in the $4p$ sublevel?

16.

How many sublevels are in each of the following major energy levels?

$n = 2$ sublevels

$n = 5$ sublevels

$n = 4$ sublevels

$n = 3$ sublevels

17.

What are the letter designations for the sublevels in each of the following major energy levels?

Type the answer using the format s,p with a comma (,) between the letters.

$n = 2$

$n = 1$

$n = 3$