

NAME: _____ DATE: _____ PERIOD: _____

WORKSHEET "Quantum Mechanics"

Give the orbital notation, the electron configuration, the abbreviated electron configuration, and the quantum number set for the following.

copper	orbital notation
	electron configuration
	abbreviated electron configuration
	quantum number set
Polonium	orbital notation
	electron configuration
	abbreviated electron configuration
	quantum number set

Potassium	orbital notation
	electron configuration
	abbreviated electron configuration
	quantum number set
Iridium	orbital notation
	electron configuration
	abbreviated electron configuration
	quantum number set

R1. Excess concentrated aqueous ammonia is added to a solution of nickel(II) nitrate. _____

Which of the reactants acts as a Lewis acid?

1. Give the abbreviated electron configuration of the following: (Give both standard and numerical order forms.)

a. K^+ _____

d. S^{2-} _____

b. Ag^+ _____

e. W^{2+} _____

c. Al^{3+} _____

f. Cr^{3+} _____

2. Classify each of the following atomic electron configurations as (GS) ground state, (ES) excited state, or (FS) forbidden state.

a. $1s^2 2s^2 2p^5 3s^1$ _____

c. $[Kr] 4d^{10} 5s^3$ _____

e. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2$ _____

b. $1s^2 2s^2 2p^6 3s^2 3p^5 4p^1$ _____

d. $1s^2 2s^2 2p^{10} 3s^2 3p^5$ _____

AP1. Which of the following conclusions can be drawn from J. J. Thomson's cathode ray experiments?

- Atoms contain electrons
- Practically all the mass of an atom is contained in its nucleus
- Atoms contain protons, neutrons, and electrons
- Atoms have a positively charged nucleus surrounded by an electron cloud
- No two electrons in one atom can have the same four quantum numbers

AP2. Which of the following represents the ground state electron configuration for the Mn^{3+} ion?

- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2 4s^2$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^1$

AP3. $1s^2 2s^2 2p^6 3s^2 3p^3$

Atoms of an element, X, have the electronic configuration shown above. The compound most likely formed with magnesium, Mg, is

- a. MgX b. Mg_2X c. MgX_2 d. MgX_3 e. Mg_3X_2

Use the following choices to answer AP5-AP8 below:

- $1s^2 2s^2 2p^5 3s^2 3p^5$
- $1s^2 2s^2 2p^6 3s^2 3p^6$
- $1s^2 2s^2 2p^6 2p^{10} 3s^2 3p^6$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$

____ AP4. The ground state configuration of a common ion of an alkaline earth element

____ AP5. The ground-state configuration of a negative ion of a halogen

____ AP6. An impossible electronic configuration

____ AP7. The ground-state configuration for the atoms of a transition element