Electron Configuration Practice

Write the **electron configuration** and **orbital notations** for the following atoms:

Element	Atomic Number	# of e^-	Electron Configuration and Orbital Notation
F			
N			
Na			
Ca			
Al			
Br			
Mg			

Element	Atomic Number	# of e^-	Electron Configuration and Orbital Notation
S			
Fe			
Ge			
B			
Sc			
P			
He			

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ELECTRONS PRACTICE PACKET

Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
Si			Longhand Configuration:
			Shorthand Noble Gas Configuration:
			Orbital Filling:

Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
Cr			Longhand Configuration:
			Shorthand Noble Gas Configuration:
			Orbital Filling:

Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
K^+			Longhand Configuration:
			Shorthand Noble Gas Configuration:
			Orbital Filling:

Draw the Bohr diagram for each of the following elements:

Helium p = n = e =	Carbon p = n = e =	Aluminum p = n = e =
Chlorine p = n = e =	Krypton p = n = e =	Tin p = n = e =
Strontium +2 p = n = e =	Lead +4 p = n = e =	Copper p = n = e =
Magnesium +2 p = n = e =	Molybdenum p = n = e =	Chlorine -1 p = n = e =

Fill in the table below:

Orbital	Shape	Maximum Number of Electrons
s		
p		
d		
f		

Determine which elements are denoted by the following electron configurations:

1. $1s^2 2s^2 2p^6 3s^2 3p^4$ _____
2. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ _____
3. [Kr] $5s^1 4d^{10}$ _____
4. [Xe] $6s^2 4f^{14} 5d^4$ _____

Correct each of the following electron configurations:

1. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$ _____
2. $1s^2 2s^2 2p^6 3s^3 3d^5$ _____
3. [Ra] $7s^2 5f^8$ _____
4. [Kr] $5s^2 5d^{10} 5p^5$ _____
5. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 5d^8 5p^5$ _____
6. $1s^2 2s^2 2p^5 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10}$ _____
7. $1s^2 2s^3 2p^6$ _____

How many valence electrons are in the following elements:

1. Beryllium: _____
2. Silicon: _____
3. Chlorine: _____

What does **Hund's Rule** say about how electrons are filled?

What does **Aufbau's Principle** say about how to fill electron orbitals?

What does **Pauli's Exclusion Principle** say about paired electrons?

Electron Configuration Practice

Write the **electron configuration** and **orbital notations** for the following atoms:

Element	Atomic Number	# of e⁻	Electron Configuration and Orbital Notation
F	9	9	$1s^2 2s^2 2p^5$ $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow\downarrow}{2p}$ $\frac{\uparrow\downarrow}{2p}$ $\frac{\uparrow}{2p}$
N	7	7	$1s^2 2s^2 2p^3$ $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$
Na	11	11	$1s^2 2s^2 2p^6 3s^1$ $\frac{\uparrow}{3s}$
Ca	20	20	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$ $\frac{\uparrow\downarrow}{4s}$
Al	13	13	$1s^2 2s^2 2p^6 3s^2 3p^1$ $\frac{\uparrow\downarrow}{3s}$ $\frac{\uparrow}{3p}$ $\frac{}{3p}$ $\frac{}{3p}$
Br	35	35	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$ $\frac{\uparrow\downarrow}{4s}$ $\frac{\uparrow\downarrow}{3d}$ $\frac{\uparrow\downarrow}{3d}$ $\frac{\uparrow\downarrow}{3d}$ $\frac{\uparrow\downarrow}{3d}$ $\frac{\uparrow\downarrow}{3d}$ $\frac{\uparrow\downarrow}{4p}$ $\frac{\uparrow\downarrow}{4p}$ $\frac{\uparrow}{4p}$
Mg	12	12	$1s^2 2s^2 2p^6 3s^2$ $\frac{\uparrow\downarrow}{3s}$

Element	Atomic Number	# of e⁻	Electron Configuration and Orbital Notation
S	16	16	$1s^2 2s^2 2p^6 3s^2 3p^4$ $\underset{3s}{\uparrow\downarrow}$ $\underset{3p}{\uparrow\downarrow\ 1\ 1}$
Fe	26	26	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$ $\underset{4s}{\uparrow\downarrow}$ $\underset{3d}{\uparrow\downarrow\ 1\ 1\ 1\ 1}$
Ge	32	32	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$ $\underset{4s}{\uparrow\downarrow}$ $\underset{3d}{\uparrow\downarrow\ \uparrow\downarrow\ \uparrow\downarrow\ \uparrow\downarrow\ \uparrow\downarrow}$ $\underset{4p}{1\ 1\ -}$
B	5	5	$1s^2 2s^2 2p^1$ $\underset{2s}{\uparrow\downarrow}$ $\underset{2p}{1\ -\ -}$
Sc	21	21	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$ $\underset{4s}{\uparrow\downarrow}$ $\underset{3d}{1\ -\ -\ -\ -}$
P	15	15	$1s^2 2s^2 2p^6 3s^2 3p^3$ $\underset{3s}{\uparrow\downarrow}$ $\underset{3p}{1\ 1\ 1}$
He	2	2	$1s^2$ $\underset{1s}{\uparrow\downarrow}$

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ELECTRONS PRACTICE PACKET

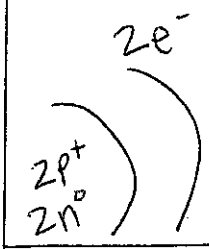
Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
Si	14	14	Longhand Configuration: $1s^2 2s^2 2p^6 3s^2 3p^2$
			Shorthand Noble Gas Configuration: $[Ne]3s^2 3p^2$
			Orbital Filling: [Ne] $\frac{\uparrow\downarrow}{3s}$ $\frac{\uparrow}{3p}$ $\frac{\uparrow}{3p}$ $\frac{}{3p}$

Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
Cr	24	24	Longhand Configuration: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
			Shorthand Noble Gas Configuration: $[Ar]4s^2 3d^5$
			Orbital Filling: [Ar] $\frac{\uparrow}{4s}$ $\frac{\uparrow}{3d}$ $\frac{\uparrow}{3d}$ $\frac{\uparrow}{3d}$ $\frac{\uparrow}{3d}$ $\frac{\uparrow}{3d}$

Element	Atomic Number	# of e^-	Electron Configurations and Orbital Filling Diagrams
K^+	19	18	Longhand Configuration: $1s^2 2s^2 2p^6 3s^2 3p^6$
			Shorthand Noble Gas Configuration: [Ar] $[Ne]3s^2 3p^6$
			Orbital Filling: [Ne] $\frac{\uparrow\downarrow}{3s}$ $\frac{\uparrow\downarrow}{3p}$ $\frac{\uparrow\downarrow}{3p}$ $\frac{\uparrow\downarrow}{3p}$

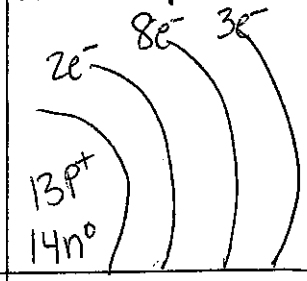
Draw the Bohr diagram for each of the following elements:

Helium p = n = e =

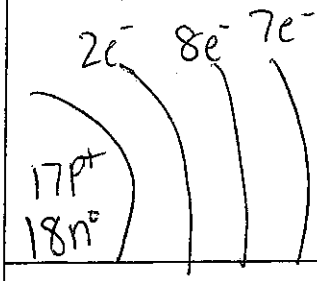


Carbon p = n = e =

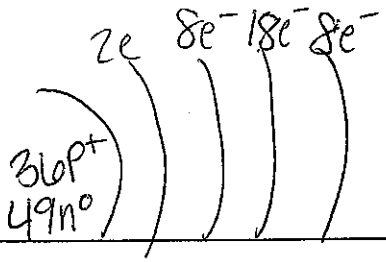
Aluminum p = n = e =



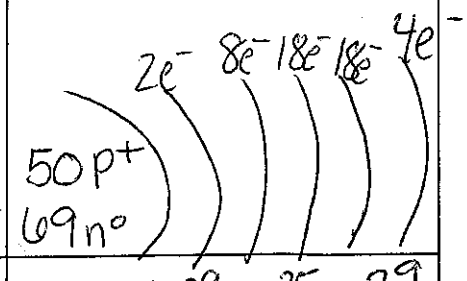
Chlorine p = n = e =



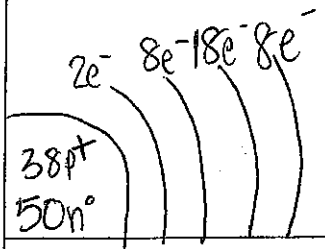
Krypton p = n = e =



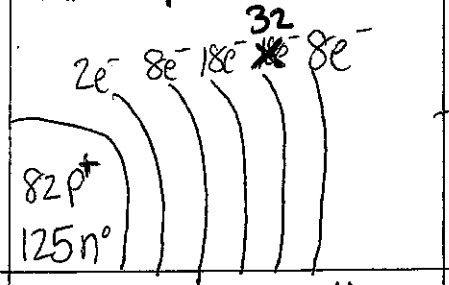
Tin p = n = e =



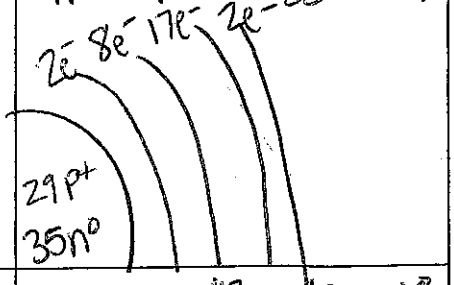
Strontium +2 p = n = e =



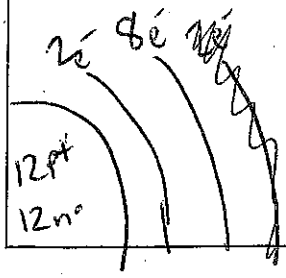
Lead +4 p = n = e =



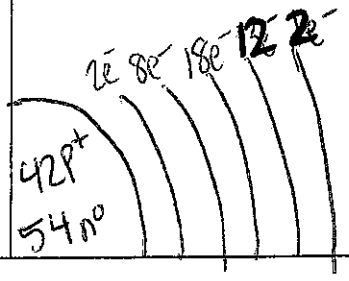
Copper p = 29 n = 35 e = 29



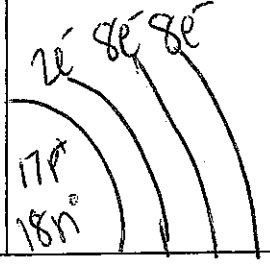
Magnesium +2 p = 12 n = 12 e = 10



Molybdenum p = 42 n = 54 e = 42



Chlorine -1 p = 17 n = 18 e = 18



Fill in the table below:

Orbital	Shape	Maximum Number of Electrons
s		2
p		6
d		10
f		14

Determine which elements are denoted by the following electron configurations:

1. $1s^2 2s^2 2p^6 3s^2 3p^4$ — Sulfur (S)
2. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ — Rubidium (Rb)
3. [Kr] $5s^2 4d^{10}$ — Cadmium (Cd)
4. [Xe] $6s^2 4f^{14} 5d^4$ — Tungsten (W)

Correct each of the following electron configurations:

1. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 \cancel{4d^{10}} 3 4p^5$
2. $1s^2 2s^2 2p^6 3s^3 \cancel{3p^6}\ 0$
3. ~~[Ra]~~ [Rn] $7s^2 5f^8$
4. [Kr] $5s^2 \cancel{5d^{10}}\ 4 5p^5$
5. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 \cancel{5d^{10}}\ 4\ 10 \cancel{5p^6}\ 3$
6. $1s^2 2s^2 2p^{\cancel{6}} 6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10}$
7. $1s^2 2s^{\cancel{2}} 2 2p^{\cancel{6}} 7$

How many valence electrons are in the following elements:

1. Beryllium: 2
2. Silicon: 4
3. Chlorine: 7

What does **Hund's Rule** say about how electrons are filled?

Every orbital in a sublevel needs to have 1 electron in it before the electrons start pairing up

What does **Aufbau's Principle** say about how to fill electron orbitals?

fill electrons with lowest energy level before moving to a higher level

What does **Pauli's Exclusion Principle** say about paired electrons?

electrons in a orbital must have opposite spins