

Electron Configurations

Name _____

PART A – ORBITAL DIAGRAMS & LONGHAND ELECTRON CONFIGURATION

Use the patterns within the periodic table to draw orbital diagrams and write longhand electron configurations for the following atoms.

	Symbol	# e ⁻	Orbital Diagram and Longhand Electron Configuration
1.	Mg		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:
2.	P		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:
3.	V		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:
4.	Ge		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:
5.	Kr		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:
6.	Sb		<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 1s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 2s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 2p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 3s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3p </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> 4s </div> <div style="text-align: center;"> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> <hr style="width: 20px; border: 0.5px solid black;"/> 3d </div> </div> <hr style="border: 0.5px solid black;"/> Electron configuration:

PART B

IDENTIFY THE ELEMENT DESCRIBED BELOW:

1. WHICH ELEMENT CONTAINS A FULL SECOND ENERGY LEVEL?
2. WHICH ELEMENT CONTAINS THREE UNPAIRED ELECTRONS IN ITS THIRD ENERGY LEVEL?
3. WHICH ELEMENT CONTAINS FIVE ELECTRONS IN ITS 3D ORBITAL?

PART C – RULES OF ELECTRON CONFIGURATIONS

Which of the following “rules” is being violated in each electron configuration below? Explain your answer for each. **Hund’s Rule, Pauli Exclusion Principle, Aufbau Principle**

