

Name: Key
Blk: _____ Date: _____

Chemistry 11 QUANTUM NUMBERS AND ORBITAL DIAGRAM

THERE ARE FOUR QUANTUM NUMBERS:

1. The Principle Quantum Number "n" describes the SIZE of the orbital (higher the number, larger the size)
2. The Second Quantum Number "l" designates the SHAPE of the orbital. "s" - spherical
"p" - double lobe
"d + f" - complex lobes
3. The Third Quantum Number "m" describes the orbitals ORIENTATION about the x, y and z axes. (We live in a 3 dimensional world)
4. The Fourth Quantum Number "s" or "m" designates the SPIN of the electrons found in each orbital. Each electron spins in opposite direction because of the force of repulsion.

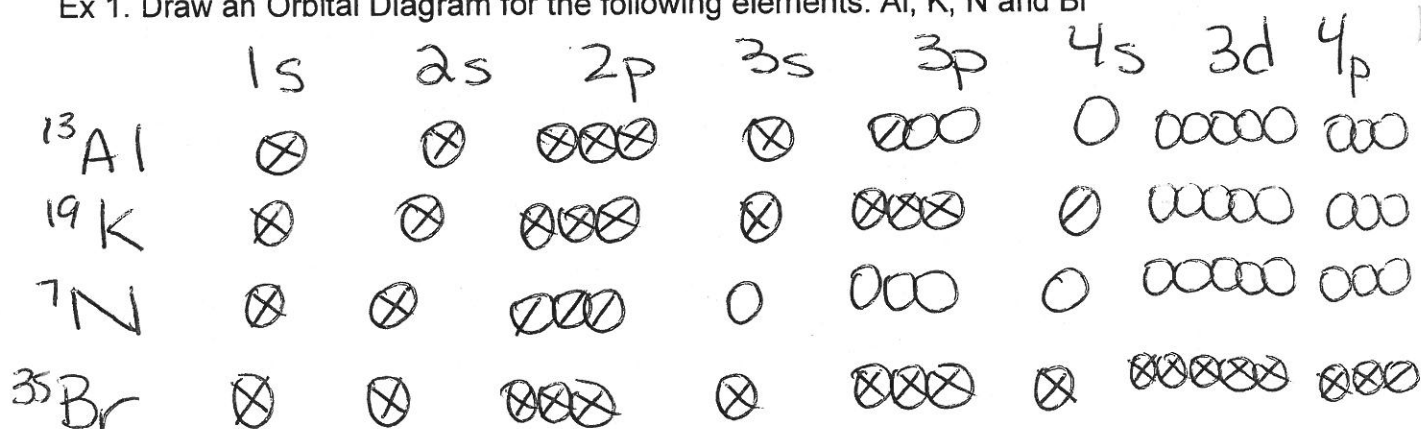
THE PAULI EXCLUSION PRINCIPLE STATES THAT NO TWO ELECTRONS CAN HAVE THE SAME FOUR QUANTUM NUMBERS.

ORBITAL DIAGRAMS: are used to illustrate the four quantum numbers.

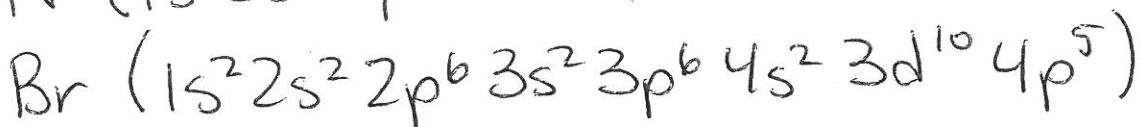
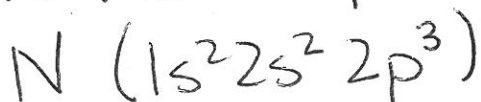
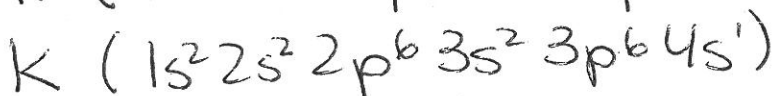
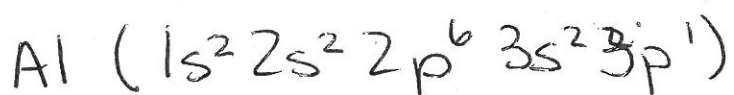
To draw an ORBITAL DIAGRAM you must follow these conventions: Think "DATA TABLE"

1. Label the COLUMN HEADERS with increasing energy levels (orbitals)
2. Label the ROW HEADERS with the elemental symbol
3. Draw in a circle to represent each orbital
4. Place a forward slash into each individual orbital FIRST before pairing it with a backward slash.

Ex 1. Draw an Orbital Diagram for the following elements: Al, K, N and Br



Ex 2: Represent the above elements using ELECTRON CONFIGURATIONS:



Ex 3: Represent the above elements using CORE NOTATION:

