**Worksheet #2**

**Fill in the chart below using an ↑and ↓ as electrons - find the total number of electrons and use that as well as the Periodic Table to find the identity of each element.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element** | **Total # e-** | **Orbital Filling** | | | | | | | | | | | | | | | | | | **Electron Config.** |
| 1s | 2s | 2px | 2py | 2pz | 3s | 3px | 3py | 3pz | 4s | 3d1 | 3d2 | 3d3 | 3d4 | 3d5 | 4px | 4py | 4pz |  |
| Na |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p5 |
| H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p63s23p1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p63s23p64s1 |
| Ca |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p6 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element** | **# e-** | 1s | 2s | 2px | 2py | 2pz | 3s | 3px | 3py | 3pz | 4s | 3d1 | 3d2 | 3d3 | 3d4 | 3d5 | 4px | 4py | 4pz | **Electron Config.** |
| Ti |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p63s23p2 |
| C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1s22s22p63s23p64s23d6 |
| Br |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. Circle which of the following orbital destinations are possible.
   1. 7s b) 1p c) 5d d) 2d e) 4f f) 5g g) 6i
2. Circle which of the following electron configurations is ruled out by the Pauli exclusion principle.

a) 1s22s22p7 b) 1s22s22p63s3 c) 1s22s22p63s23p64s23d12 d) 1s22s22p63s23p6

1. Explain why the following ground-state electron configurations are not possible:

|  |  |  |
| --- | --- | --- |
| **Q** | **Config.** | **Reason it is wrong** |
|  | 1s22s32p3 |  |
|  | 1s22s22p33s6 |  |
|  | 1s22s22p73s23p8 |  |
|  | 1s22s22p63s23p14s23d14 |  |

1. Draw a section of an orbital diagram that would violate each of the following rules

|  |  |  |
| --- | --- | --- |
| Aufbau Principle | Pauli Exclusion Principle | Hund’s Rule |
|  |  |  |