**Dougherty Valley HS AP Chemistry**

**WORKSHEET #3**

**Atomic Structure – Electron Configuration**

**Name: Date: Period: Seat #:**

For each given element, fill in the orbital diagram and then write the electron configuration for the element.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | 2. | 3. | 4. | 5. | 6. |
|  |  |  |  |  |  |
| Element: Ar# of e–’s: \_\_\_ | Element: Mg# of e–’s: \_\_\_ | Element: N# of e–’s: \_\_\_ | Element: Li# of e–’s: \_\_\_ | Element: P# of e–’s: \_\_\_ | Element: Cl# of e–’s: \_\_\_ |

|  |
| --- |
| Write the electron configurations of each of these in **long form** and **short form (noble gas)**: |
| 1. Ar |
|  Ar |
|  |
| 2. Mg |
|  Mg |
|  |
| 3. N |
|  N |
|  |
| 4. Li |
|  Li |
|  |
| 5. P |
|  P |
|  |
| 6. Cl |
|  Cl |

|  |  |
| --- | --- |
|  | 7. Fill in the orbital diagram for the element, Fe, and write the electron configuration of Fe in the long and short form. Fe Fe |

A few elements do not follow the “rules”. There is some lowering of the energy of the atom by completely filling or half-filling the five d-orbitals.

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|  | 8. Fill in the orbital diagram for the element, Cu, and write the electron configuration of Cu in the long and short form. Cu Cu |

|  |  |
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|  | 9. Fill in the orbital diagram for the element, Cr, and write the electron configuration of Cr in the long and short form. Cr Cr |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Shade in the six elements that do not follow the Aufbau Principle: |  | Sc | Ti | V | Cr | Mn | Fe | Co | Ni | Cu | Zn |
|  | Y | Zr | Nb | Mo | Tc | Ru | Rh | Pd | Ag | Cd |
|  | La | Hf | Ta | W | Re | Os | Ir | Pt | Au | Hg |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1s |  |  | Fill in the orbitals that are filled by these elements. |  |  |  |  |  |  |  | 1s |
| 2s |  |  |  |  |
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10. Write the orbital occupied by the last electron of each of the following elements:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| As | W | Li | U | O | Rn | V |
|  |  |  |  |  |  |  |