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Chemistry 11 – Electron Configuration Worksheet

1) *Why is the subshell, **3d**, not referred to as **4d** instead since its apart of the 4th period?*

When the 3d subshell is FULL is drops BELOW 4S in energy. Since an energy level MUST begin with "s", it cannot be 4d.

2) *Give the full electronic configuration for the following particles:*

Be: $1s^2\ 2s^2$

S: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$

Kr: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6$

V: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^3$

Mo: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^1\ 4d^5$

Ga: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^1$

Ga^{3+}: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^0\ 4p^0$

bromide: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6$

3) *Give the **core notation** for the following particles:*

Li: $[He]\ 2s^1$

Al: $[Ne]\ 3s^2\ 3p^1$

P: $[Ne]\ 3s^2\ 3p^3$

I: $[Kr]\ 5s^2\ 4d^{10}\ 5p^5$

Cu^{+1}: $[Ar]\ 3d^{10}\ 4s^0$

Kr: $[Ar]\ 4s^2\ 3d^{10}\ 4p^6$

core notation continued…

Es: $[Rn]\,7s^2\,5f^{11}$	**Hf:** $[Xe]\,6s^2\,4f^{14}\,5d^2$
K^{+1}: $[Ne]\,3s^2\,3p^6$	**Ce:** $[Xe]\,6s^2\,4f^2$
Sn^{+4}: $[Kr]\,4d^{10}\,5s^0\,5p^0$	**N^{3-}:** $[He]\,2s^2\,2p^6$

4) *Determine the number of **valence electrons** in the following particles. Show work by completing the electron structure and circle the electrons that make up your answer.*

phosphorus: $[Ne]\,3s^{(2)}\,3p^{(3)}$ (5)

Selenium: $[Ar]\,4s^{(2)}\,3d^{10}\,4p^{(4)}$ (6)

Text

Indium(III) ion: In^{+3}: $[Xe]\,4f^{14}\,5d^{(6)}\,6s^0$ (6)

$In: [Xe]\,6s^2\,4f^{14}\,5d^7$

5) *Identify the following elements or ions:*

1) $1s^2\,2s^2\,2p^3$: nitrogen
2) $1s^2\,2s^2\,2p^6\,3s^2\,3p^1$: aluminum
3) $1s^2\,2s^2\,2p^6$: fluoride (9 protons)
4) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^2$: zinc
5) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^0$: Zn^{+2} (zinc ion)
6) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^9\,4s^0$: Cu^{+2}
7) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^2\,4p^6\,5s^0\,4d^2$: Zr^{+2}
8) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^2\,4p^6\,5s^0\,4d^4$: Mo^{+2}
9) $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^2\,4p^6\,5s^2\,4d^7$: Rh (rhodium)
10) $1s^2\,2s^2\,2p^6\,3s^2\,3p^1$: aluminum