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CHEMISTRY SEM I - MDC-1BY DR. M. KRAufbau Principle

Aufbau is a German word which meaning is building up.

Aufbau Principle states that electrons fill atomic orbitals of lowest available energy before occupying higher energy level.

electrons filled by $(n+l)$ energy value.

Where n - is shell no.

l - azimuthal quantum no.

the l value of $s=0$

$p=1$

$d=2$

$f=3$

so first we can find value of following

$$1s = \overset{(n+l)}{1+0} = 0$$

$$2s = 2+0 = 0$$

$$2p = 2+1 = 3$$

$$3s = 3+0 = 3$$

$$3p = 3+1 = 4$$

$$\begin{aligned}
 3d &= 3+2=5 \\
 4s &= 4+0=4 \\
 4p &= 4+1=5 \\
 4d &= 4+2=6 \\
 4f &= 4+3=7 \\
 5s &= 5+0=5 \\
 5p &= 5+1=6 \\
 5d &= 5+2=7 \\
 5f &= 5+3=8
 \end{aligned}$$

SO it can be filled as $1s < 2s < 2p < 3s < 3p < 4s < 3d < 4p < 5s$

~~$$1s < 2s < 2p < 3s < 3p < 4s < 4p < 5s$$

$$1s < 2s < 3s < 3p$$~~

If the energy value of is equal the first filled that orbital which "n" value is less

eg.

$2p = 3s$ here the value of 'n' of 2p is 2 so orbital 2p filled first then 3s

and $3p = 4s$ here also electron filled in 3p first then 4s

and finally 3d
So sequence may be

$$1s \rightarrow 2s \rightarrow 2p \rightarrow 3s \rightarrow 3p \rightarrow 4s \rightarrow 3d \downarrow$$

$$4d \leftarrow 5s \leftarrow 4p$$