

Bohr's problems

Al, Lu, Werner

Schrödinger

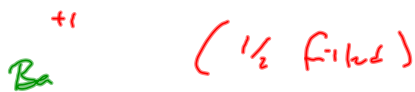
$\psi, \psi^2, \int \psi^2 r^2 dr$

orb. + a.s. $\rightarrow n, l, m$
 \rightarrow shapes
 \rightarrow nodes ($l + \text{radial}$)

e^- config - atoms / ions

$n_s \rightarrow$ Aufbau
 Pauli,
 Hund

Oct 23-9:31 AM



Oct 23-9:43 AM

n

↓

node level

$n-1 = \text{nodes}$

$n=5$
(4 nodes)

l

↓

nodes

$0 = s$
 $1 = p$
 $2 = d$
 $3 = f$
⋮

m

↓

$-l, \dots, 0, \dots, l$

m_s

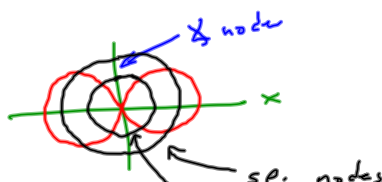
↓

spin

radial nodes = $(n-1) - l$

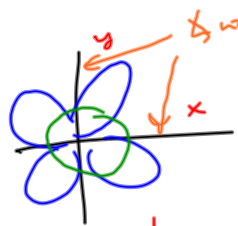
$4p_x$

3 nodes

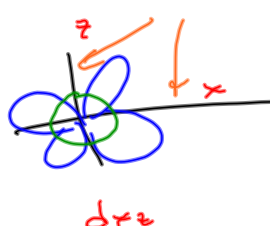


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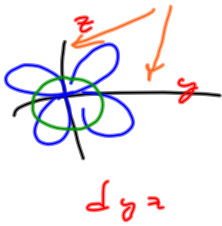
$n=4, l=2 \rightarrow d$
(3 nodes)



d_{xy}

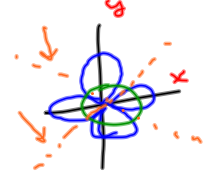


d_{xz}




d_{yz}

$0 = \text{sp. nodes}$



$d_{x^2-y^2}$



d_{z^2}

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$n=3$ s # orbitals n^2
 p
 d

Oct 23-9:59 AM

ψ ψ^2 ψ^2

$n = ?$ $n = 4$

draw all orbitals w/ $n=2$ or less

$n=1$
 $l=0$
 $m=0$

$n=2$
 $l=0$
 $m=0$

$n=2$
 $l=1$
 $m=-1, 0, 1$

Oct 23-10:01 AM

$$dB \quad \lambda = \frac{h}{p} \quad \text{with } p \sim m \cdot v$$

$$H \quad \Delta x \cdot \Delta p \geq \frac{h}{2\pi}$$

Oct 23-10:14 AM