CH 221 G	CH 221 Guide to Quantum	Numbers
<u>Quantum Number</u>	<u>Quantum Name</u>	<u>Values</u>
С	shell	1, 2, 3, 4, ∞
	subshell	0, 1, 2, (n - 1)
m,	orbital	-/ 0 +/
ms	electron spin	+1/2 or $-1/2$
Each electron in an atom can have its own unique "address" or <i>set of quantum numbers</i> . <i>Example</i> : Consider a Beryllium atom with four electrons. Beryllium is in the second per using the lowest value of n (or $n + h$) so the electrons will be placed into the $n=1$ shell before the lowest value of n (or $n + h$) so the electrons will be placed into the n=1 shell before the lowest value of n (or $n + h$) so the electrons will be placed into the n=1 shell before the lowest value of n (or $n + h$) so the electrons will be placed into the n=1 shell before the net of the net of n (or $n + h$).	iddress" or set of quantum numbers. actrons. Beryllium is in the second period, so will be placed into the $n=1$ shell before the	Each electron in an atom can have its own unique "address" or <i>set of quantum numbers</i> . <i>Example</i> : Consider a Beryllium atom with four electrons. Beryllium is in the second period, so possible n values are 1 and 2. Electrons are filled using the lowest value of n (or $n + h$) so the electrons will be placed into the $n=1$ shell before the venter the $n=2$ shell
<u>When n = 1</u> , the only allowed value of <i>l</i> is 0; likewise, the only allowed value of $m_l = 0$. electron can have either a "spin up" ($m_s = +1/2$) or "spin down" ($m_s = -1/2$) configuration.		We will place the first two electrons in a 1s orbital. Each
The first electron's set of quantum numbers (or address) will be: $\mathbf{n} = 1, l = 0, \mathbf{m}_l = 0$	or address) will be: $\mathbf{n} = 1, l = 0, \mathbf{m}_l = 0, \mathbf{m}_s = 0$	$m_{\rm s} = +1/2$
The second electron's set of quantum numbers (or address) will be: $n = 1, l = 0, m_l = 0, m_s = -1/2$	rs (or address) will be: $n = 1, l = 0, m_l = 0, r$	$m_s = -1/2$
<u>When n = 2</u> , allowed values of <i>l</i> are 0 and 1. Lowest (n + <i>l</i>) values are filled first; hence, value of $(2 + 1) = 3$. When $l = 0$, the only allowed value of $m_l = 0$. We will place the n either a "spin up" ($m_s = +\frac{1}{2}$) or "spin down" ($m_s = -\frac{1}{2}$) configuration.	st $(n + l)$ values are filled first; hence, a $(n + l)$ value of $m_l = 0$. We will place the next tw $1/2$ configuration.	<u>When n = 2</u> , allowed values of <i>l</i> are 0 and 1. Lowest (n + <i>l</i>) values are filled first; hence, a (n + <i>l</i>) value of $(2 + 0) = 2$ will be filled before a (n + <i>l</i>) value of $(2 + 1) = 3$. When $l = 0$, the only allowed value of $m_l = 0$. We will place the next two electrons in a 2s orbital. Each electron can have either a "spin up" ($m_s = +\frac{1}{2}$) or "spin down" ($m_s = -\frac{1}{2}$) configuration.
The third electron's set of quantum numbers (or address) will be: $n = 2, l = 0, m_l = 0$		$0, m_s = +1/2$
The fourth electron's set of quantum numbers (or address) will be: $n = 2, l = 0, m_l = 0, m_s = -1/2$	s (or address) will be: $n = 2, l = 0, m_l = 0, m_l$	$n_{\rm s} = -1/2$

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