

Orbital Cloud Model of the Atom

Gather Together...

-Notes from last class

-Today's notes Page

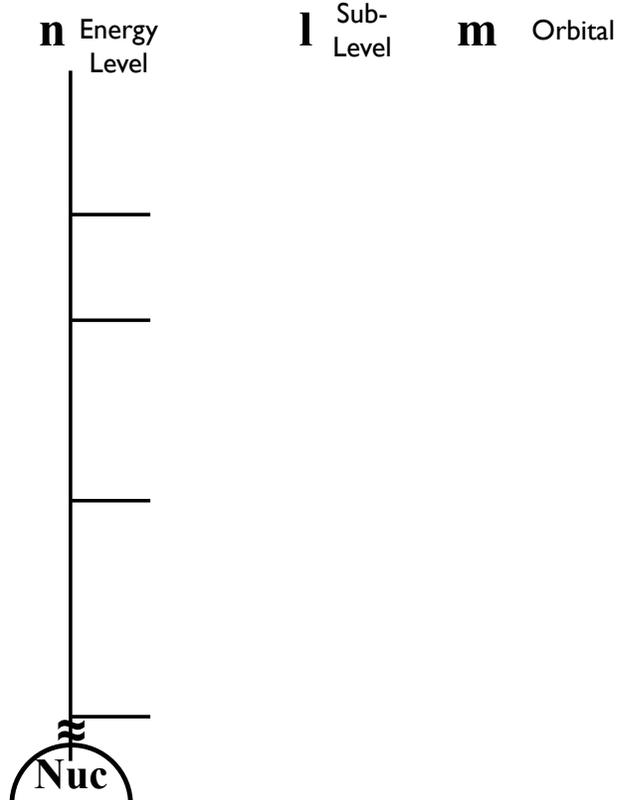
Orbital Cloud Model

Quantum Numbers Review

- Energy Level Quantum Number (n)
 - Size of energy level (cloud)
 - Values on periodic table from 1-7
 - Capacity = $2n^2$ rule
- Sub-level Quantum Number (l)
 - The number of sub-levels in an energy level is n
 - Named s, p, d, f
- Orbital Quantum Number (m)
 - Space occupied by 2 electrons
- Spin Quantum Number (s)
 - up or down

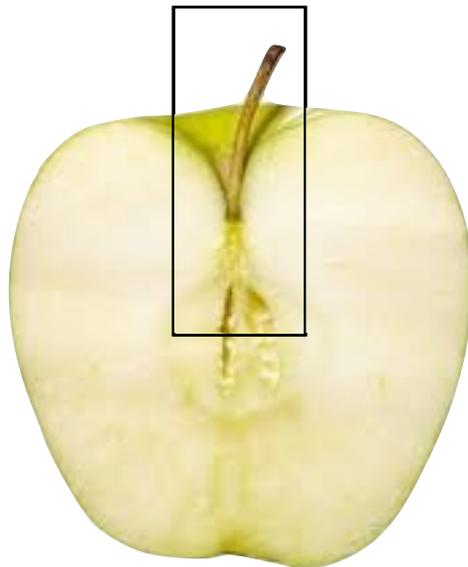
Orbital Cloud Model

Quantum Numbers



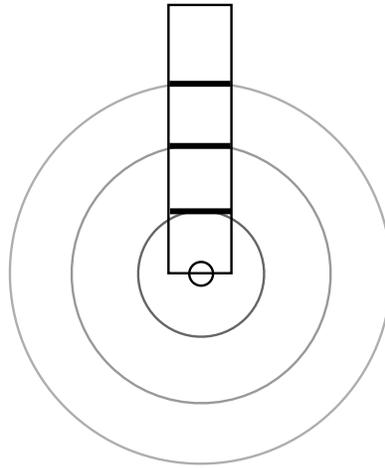
Orbital Cloud Model

Core Sample



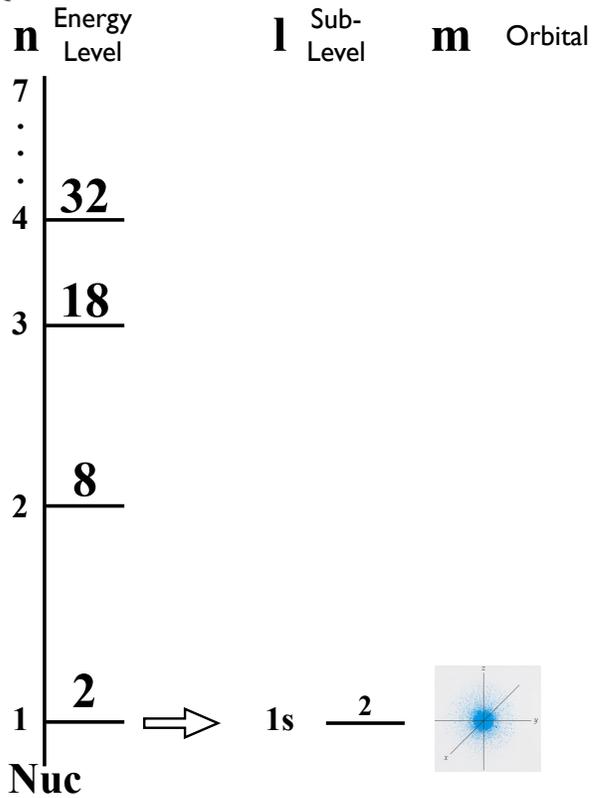
Orbital Cloud Model

Core Sample



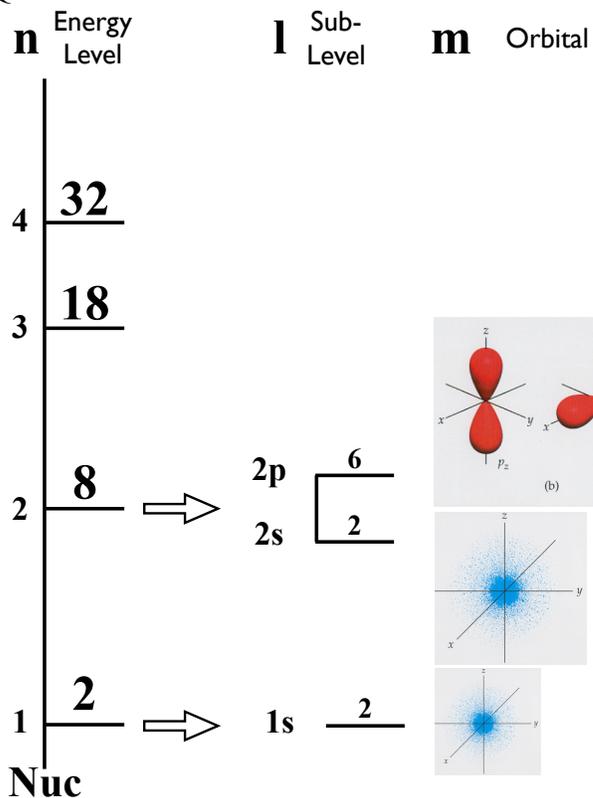
Orbital Cloud Model

Quantum Numbers



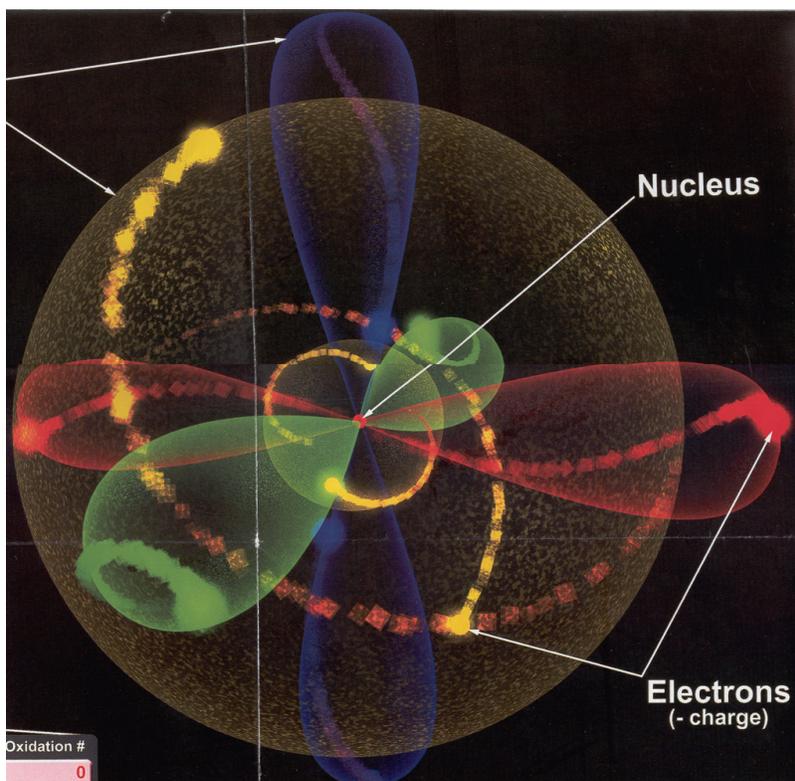
Orbital Cloud Model

Quantum Numbers



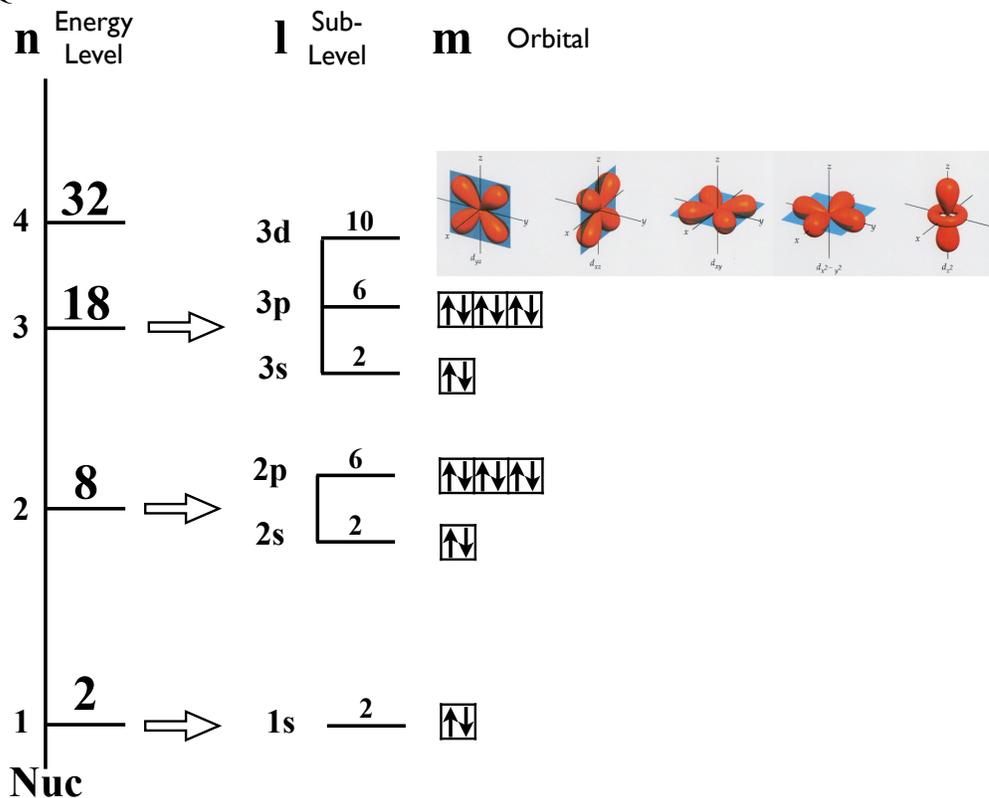
Orbital Cloud Model

Quantum Numbers



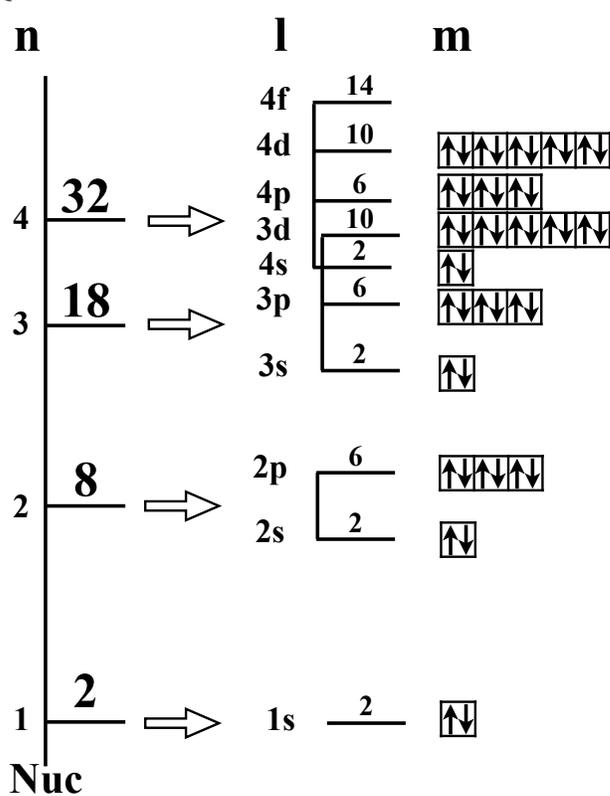
Orbital Cloud Model

Quantum Numbers



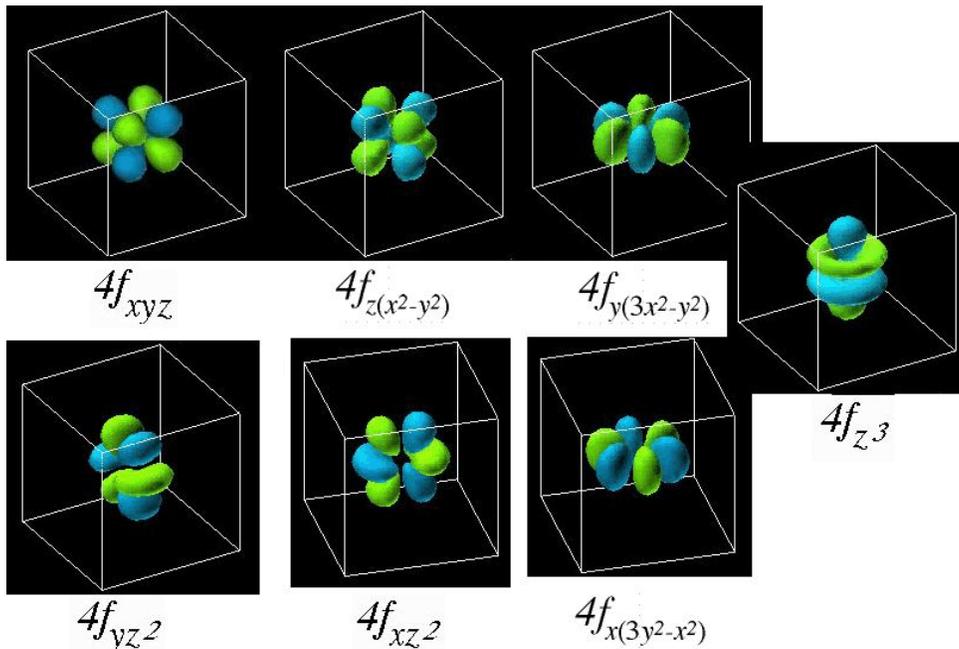
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Quantum Numbers



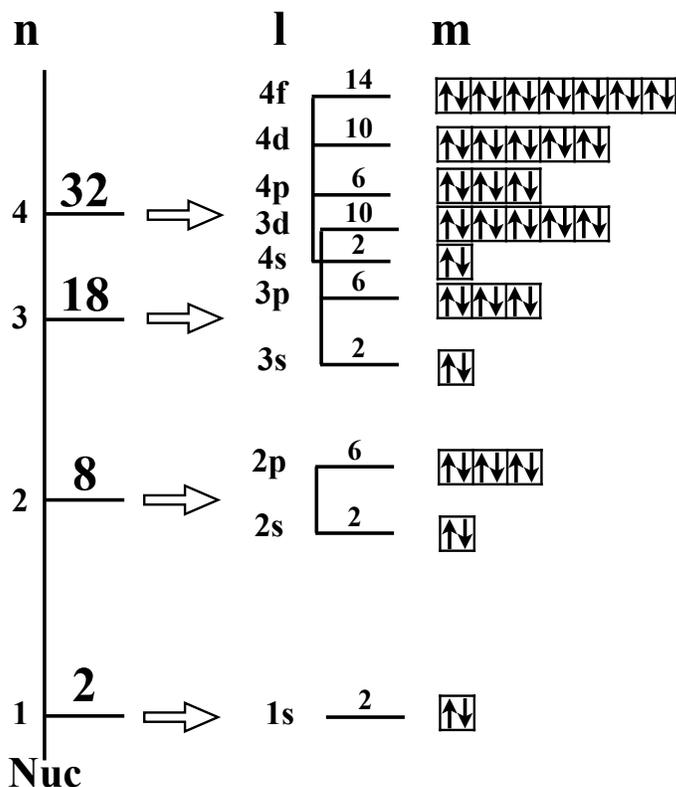
Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Quantum Numbers



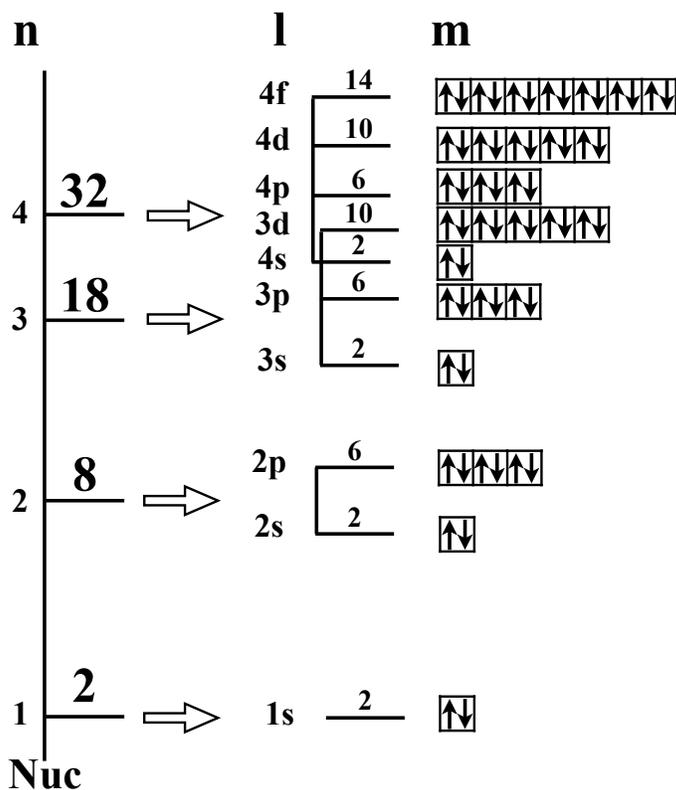
EXTRA CREDIT

Take the boxes, and make them visually accurate

shape
size
number of orbitals

Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Quantum Numbers

PERIODIC TABLE OF THE ELEMENTS

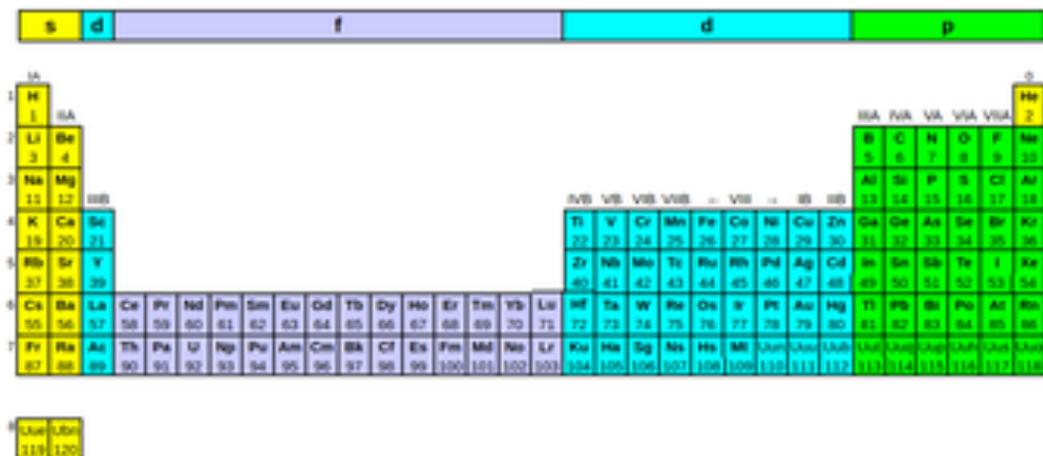
Table of Selected Radioactive Isotopes

The periodic table shows elements from Hydrogen (1) to Oganesson (118). A separate table lists selected radioactive isotopes with their half-lives and decay modes. A key defines element symbols: Atomic Number (top left), Group Number (top), Period Number (left), and Element Symbol (center). Notes at the bottom provide additional information about isotopes and element classification.

Orbital Cloud Model

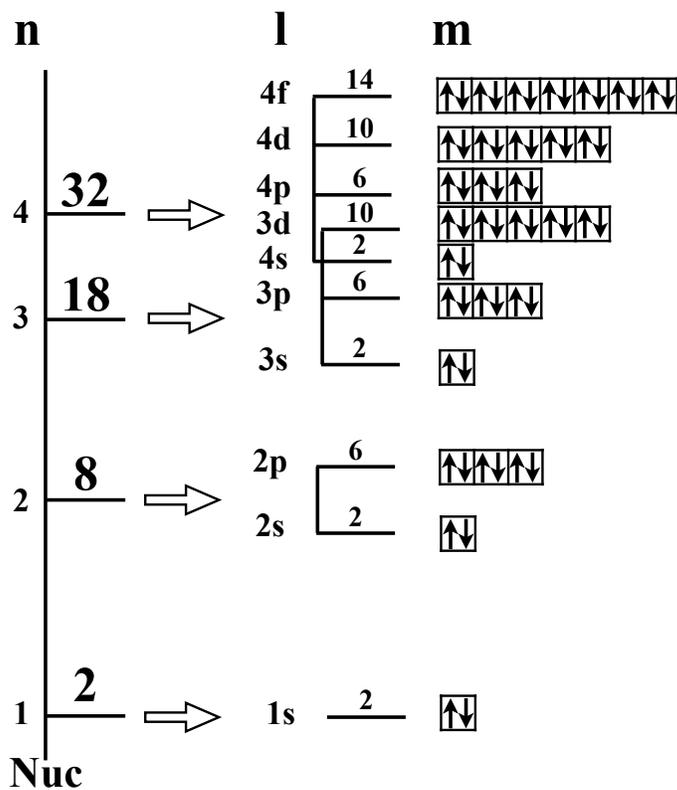
Quantum Numbers

The Modern Periodic Table (Long Form)



Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Quantum Numbers

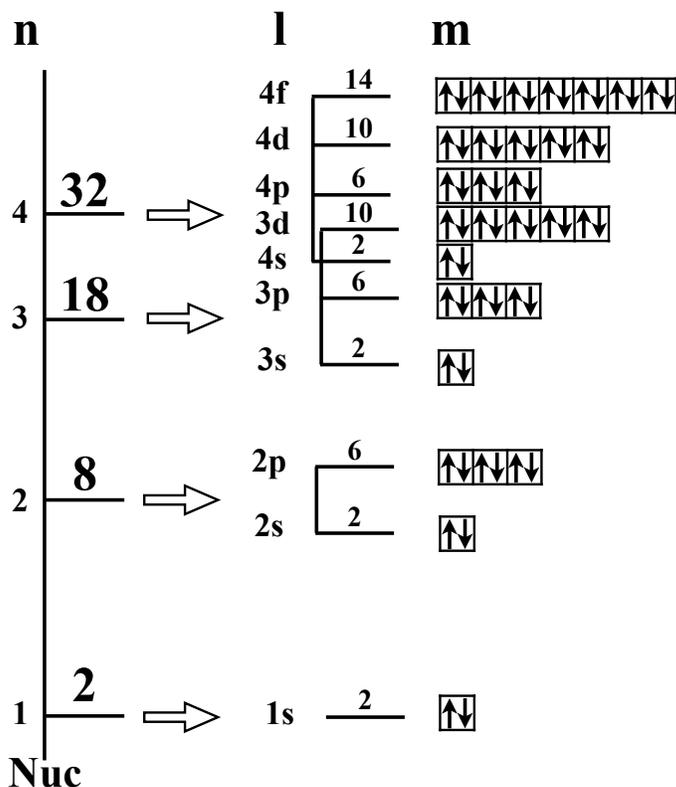
PERIODIC TABLE OF THE ELEMENTS

Table of Selected Radioactive Isotopes

The image shows a standard periodic table of elements. In the top-left corner, the element Helium (He) with atomic number 2 is circled. Above this circled element, the letter 'S' is written. The table also includes a section for 'Table of Selected Radioactive Isotopes' and a 'KEY' for oxidation states and melting points.

Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Quantum Numbers

PERIODIC TABLE OF THE ELEMENTS

Table of Selected Radioactive Isotopes

S

p

d(-1)

KEY

OXIDATION STATES (check most common)

RELATIVE STABILITY

RELATIONSHIP TO GROUP 10 (Zn)

NOTES:

(*) Radioactive

(†) Based upon values in IUPAC tables

(‡) Entries marked with question marks in the periodic table are given in parentheses in the IUPAC tables

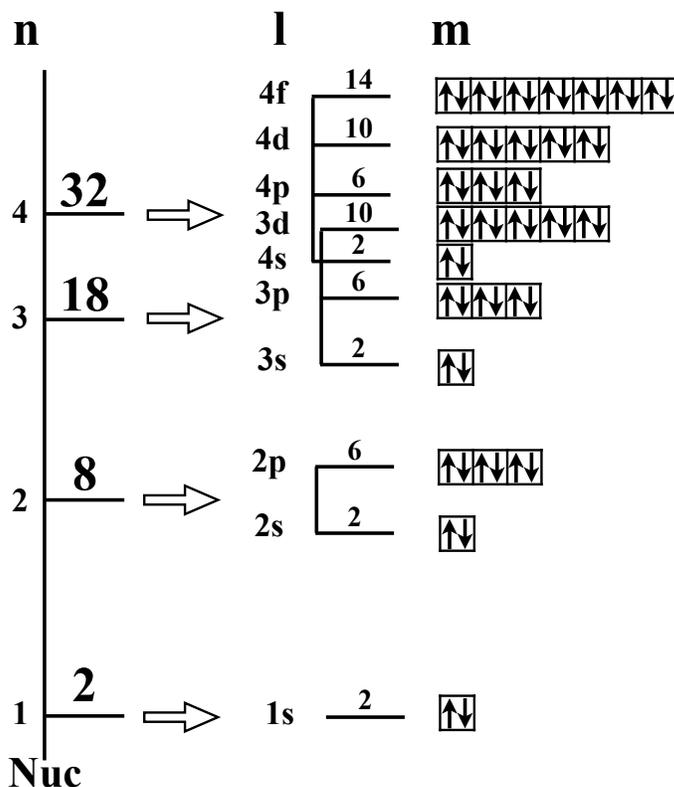
(§) Entries marked with question marks in the periodic table are given in parentheses in the IUPAC tables

The IUPAC nomenclature system, see IUPAC nomenclature of inorganic chemistry, 2006

Side 1

Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Quantum Numbers

PERIODIC TABLE OF THE ELEMENTS

Table of Selected Radioactive Isotopes

s

p

d(-1)

f(-2)

KEY

30 Zn

IONIZATION ENERGY: 10.4 eV

OXIDATION STATES: +2, +1

RELATIVE ATOMIC MASS: 65.38

NOTES:

1) $^{\circ}$ - stable isotope

2) $^{\circ}$ - stable isotope (no. 1 indicates most stable or least known isotope)

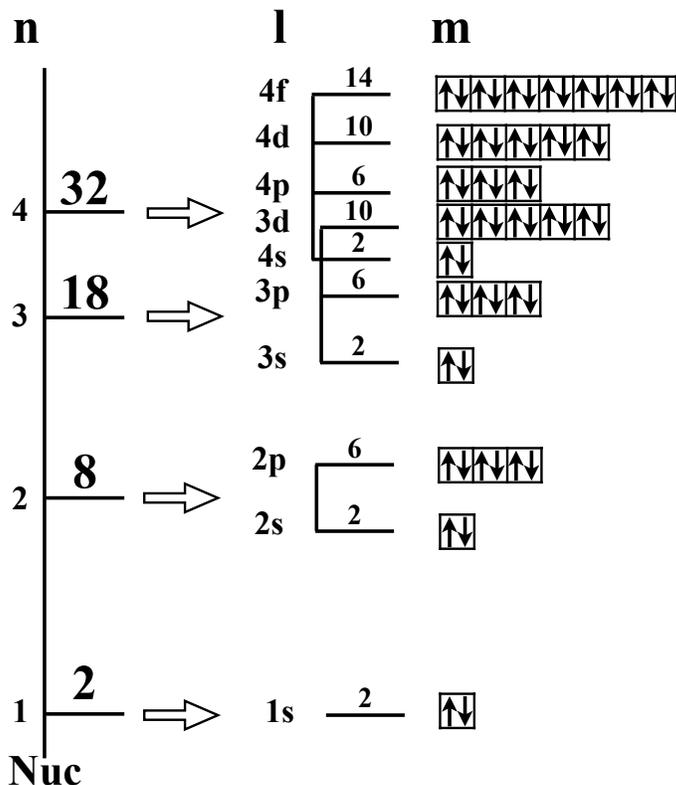
3) Empty number with degree symbol is the ground state at 0% $^{\circ}$ and 1 atm and is given in units of g/l

The I & O subgroup designations, and those recommended by the International Union of Pure and Applied Chemistry

Side 1

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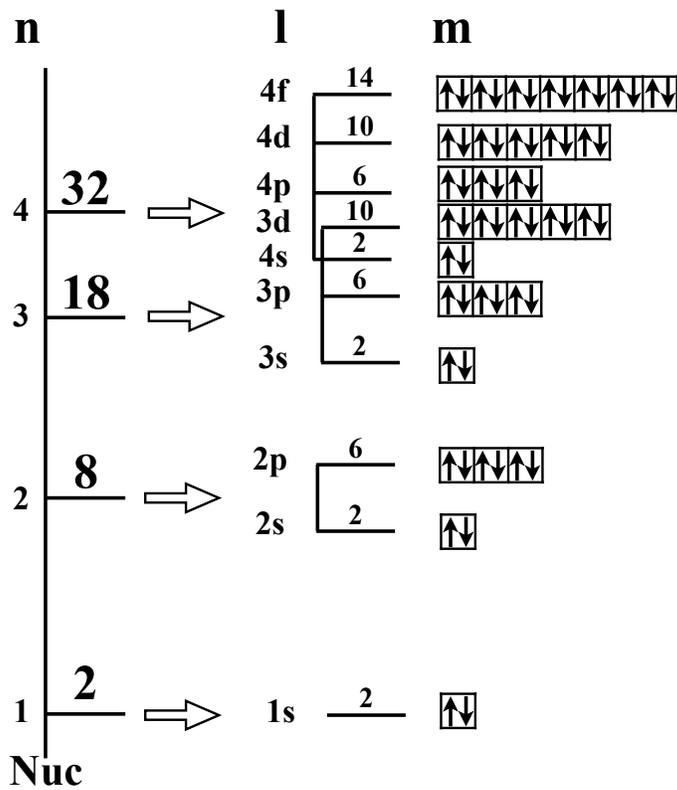
Orbital Cloud Model

Quantum Numbers

	a	b	c	d
1				
2				
3				
4				

Orbital Cloud Model

Quantum Numbers



Orbital Cloud Model

Representing Electron Structures

- Orbital Filling Diagrams
 - Oxygen
 - Copper