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CHAPTER #3

ATOMIC STRUCTURE

DATE: 19/6/2024 Homework Monday

Topic:

Chapter: 3

SubTopic:

Atomic Structure.

SHORT Question-Answers

Q:1 Distinguish b/w shell & sub shell.

*	SHELL	SUBSHELL
1.	The electron in an atom that revolve around the nucleus in one of the circular path called shell or orbit.	When shell is sub-divided is called sub-shell.
2.	Each shell is also called energy level or orbit	Sub shell are also orbitals / sub energy levels
3.	Shells are named as K, L, M, N and so on.	Each Sub-Shell can hold a specific No. of electrons; 2 for S, 6 for P 10 for d, & 14 for f.

Q:2 Why an atom electrically neutral?

* An atom is electrically neutral because negitive of number of positively charged Proton negitively and negitively charge electron are always equal to each other so these charges

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cancels out
cancles each other and make an atom Neutral.
sp

Q:3 How many subshells are there in N shells

* As N shell has a capacity of 32 electron According to its electronic Configration there are 4 sub-shells in N shell:

$N = 32 \rightarrow 1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^{10}, 4p^2$

The are 4 subshells in N shell
(4s, 4p, 4d, 4f)

Q:4 Give notation for sub-shell of M-Shell.

* According to Electronic Configration of M shell there are 3 subshells in it.

$M = 18 \rightarrow 1s^2, 2s^2, 2p^6, 3s^2, 3p^6$

There are 3 subshells in M shell
(3s, 3p, 3d)

Q:5 List the sub-shell of M-shell in order of increasing energy.

* Electronic Configration of M shell:

$1s^2, 2s^2, 2p^6, 3s^2, 3p^6$

Order of its increasing energy

$1s^2 < 2s^2 < 2p^6 < 3s^2 < 3p^6$

$3s < 3p < 3d$

Q:6 Can you Identify an atom without knowing No. of neutron in it?

* Yes, we can Identify an atom without knowing its atomic No. of Neutron Atom is identified by No. of Proton

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which are present in nucleus of an atom So neutron No. is not neccassary.

Q.1 The Electronic configration listed are incorrect. Explain what mistake have been made in each & write correct electronic. C.

a. $x = 1s^2, 2s^2, 2p^4, 3p^2$

Mistake: $3p^2$ is extra as there is a capacity of $6e^-$ in p sub-shell.

Correct: $x = 1s^2, 2s^2, 2p^6$

b. $y = 1s^2, 2s^1, 2p^1$

Mistake: $2p^1$ is extra as there is a capacity of $2e^-$ in s subshell.

Correct: $y = 1s^2, 2s^2$

c. $z = 1s^2, 2s^2, 2p^5, 3s^1$

Mistake: $3s^1$ is extra as there is a capacity of $6e^-$ in p subshell

Correct: $= 1s^2, 2s^2, 2p^6$

Q.2 Answer on book (Part (c) is Answer)

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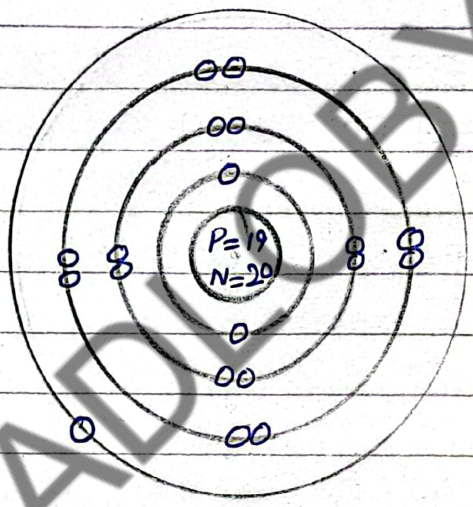
Q: 9 Draw Bohr's Model for the following atom indicating the location for e, Proton & Neutron;

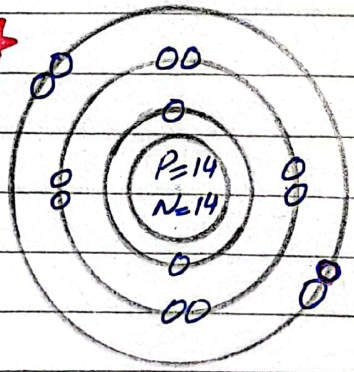
a) Potassium (Atomic No. 19), (Mass No. 39)

* No. of Proton = 19
No. of electron = 19
No. of Neutron = 20



b) Silicon (Atomic No. 14), (Mass No. 28)

No. of Proton = 14
No. of Electron = 14
No. of Neutron = 14



c) Argon (Atomic No. 18), (Mass No. 39)

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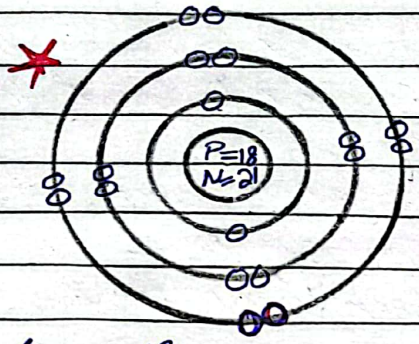

No. of proton = 18
No. of Electron = 18
No. of Neutron = 21

Q:10 Write the E.C of the following

a) $^{28}_{14}Si$

$1s^2, 2s^2, 2p^6, 3s^2, 3p^2$

b) $^{24}_{12}Mg$

$1s^2, 2s^2, 2p^6, 3s^2$

c) $^{27}_{13}Al$

$1s^2, 2s^2, 2p^6, 3s^2, 3p^1$

d) $^{40}_{18}Ar$

$1s^2, 2s^2, 2p^6, 3s^2, 3p^6$

Q:11: States the importance & uses of isotopes

"Uses of Isotopes"

i. Radioactive iodine-131 is used as a tracer in diagnosing thyroid problem.

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ii Iodine-123 is used to image the Brain.
iii Cobalt-60 is used to irradiate cancer cell.
iv Carbon-14 is used to trace the path of Carbon in photosynthesis.
v Sulphur has been used in the structure determination of thiosulfate, $S_2O_3^{-2}$ ion.

Q.12 The atomic No. of an element is 23 and its Mass No. is 56

a) How many protons & electron does an atom of this element have?

As Proton No.s are also called Atomic No. So there are 23 Protons and 23 electrons as we know that No. of protons are equal to No. of electrons.

b) How many neutron does this atom have?

There is specific formula for finding No. of Neutrons of an atom.

No. of Neutron = Mass No. - Atomic No.
= 56 - 23
= 33 Ans

No. of Neutrons are 33 in this atom.

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Q:13 The atomic symbol of aluminium is written as $^{27}_{13}Al$. What info do you get from it.

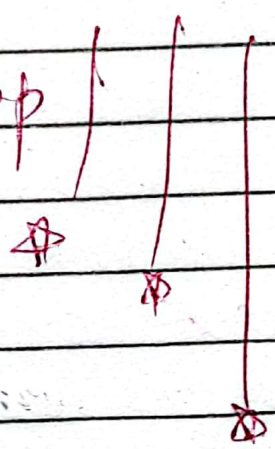
It shows that the atomic Mass or Mass Number of Aluminium is 27. and Proton No. is 13 and as we know that Protons are always equal to electron ~~so~~ so electron No. is also 13. or if we want to know the Number of Neutron so we can find it by using the value of Atomic and Mass Number.

No. of Neutron = Mass No. − Atomic No.
= 27 − 13
= 14 Answer.

Group number & period number.

Well - presented.

Keep it up



2 out of 9 = 1.24