

P.G.SEMESTER-II
CC- V
Advances in Chemistry

Unit-I Nuclear Chemistry
Topic- Shell Model of Nucleus (PART - 2)

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Ara

At peak, the Binding energy is high and nucleie at peak also correspond to the magic numbers

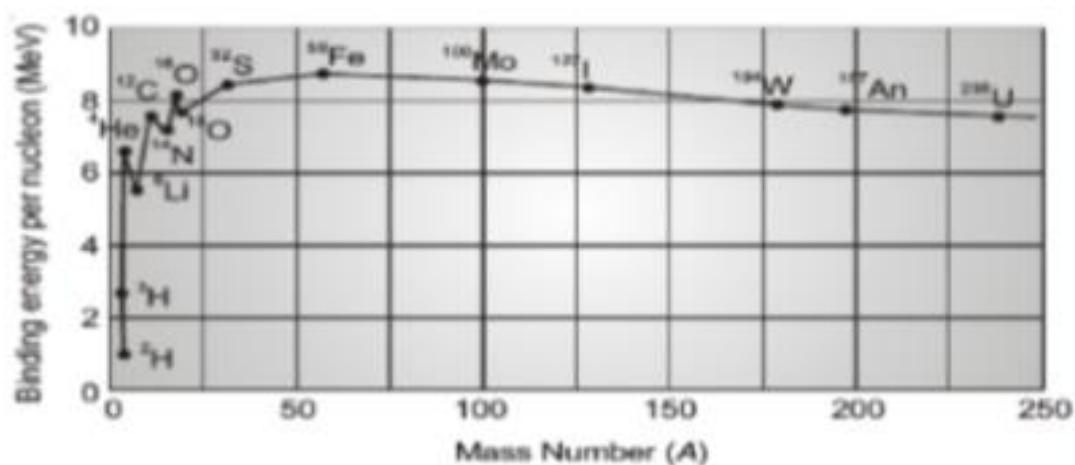
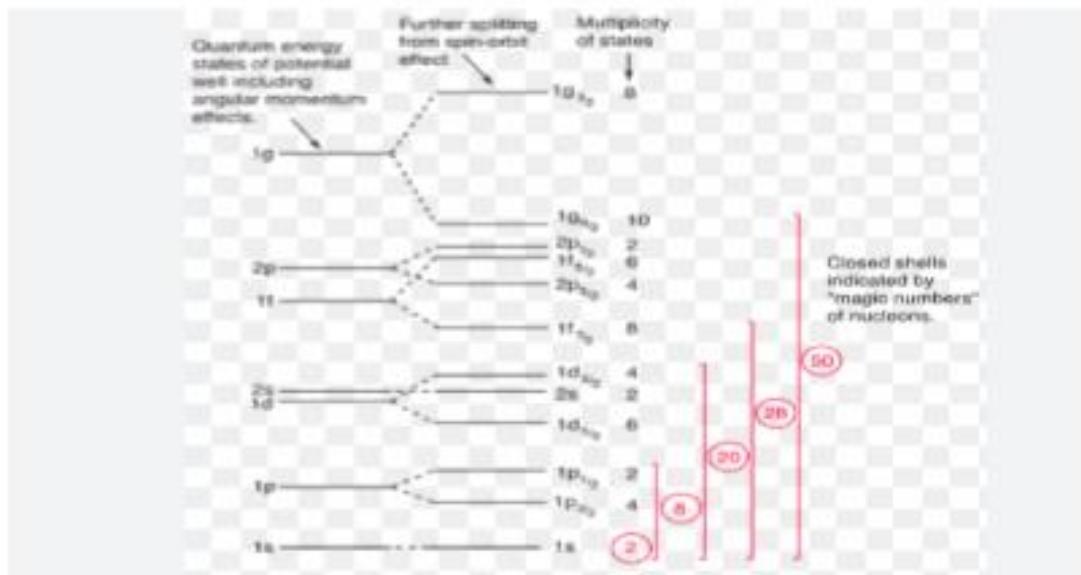


Fig.: The binding energy per nucleon as a function of mass number.

RELATION OF NUCLEAR SHELL STRUCTURE WITH MAGIC NUMBERS



Main Achievements of Shell Model

1. It explains the magic number.
2. It explains the magnetic moment of some nuclei.
3. It explains successfully ground state spin.
4. It explains the greater stability and high Binding energy

Main Limitations of Shell Model

- 1. It fails to explain the stability of four stable nuclei i.e H_2^4 , Li_3^6 , N_7^{14}
- 2. It does not predict the correct values of nuclear spin for certain nuclei.
- 3. The Quadrupole moment calculated using this model is not in good agreement.

References

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- 1.K. L. Heyde, "The nuclear shell model", in The nuclear shell model (Springer, 1994), pp. 58–154.
 - 2.K. S. Krane, D. Halliday, et al., Introductory nuclear physics (1987)



The students are requested to keep studying and stay tuned till further updates regarding the content.

THANK YOU !

You can mail your subject related queries on...

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