

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

Unit-I Nuclear Chemistry

Topic- Shell Model of Nucleus (PART - 2)

Dr. Jasmine Singh
Assistant Professor
Department of Chemistry
M.B.R.V.Pd. Singh College
(Maharaja College)
Ara

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

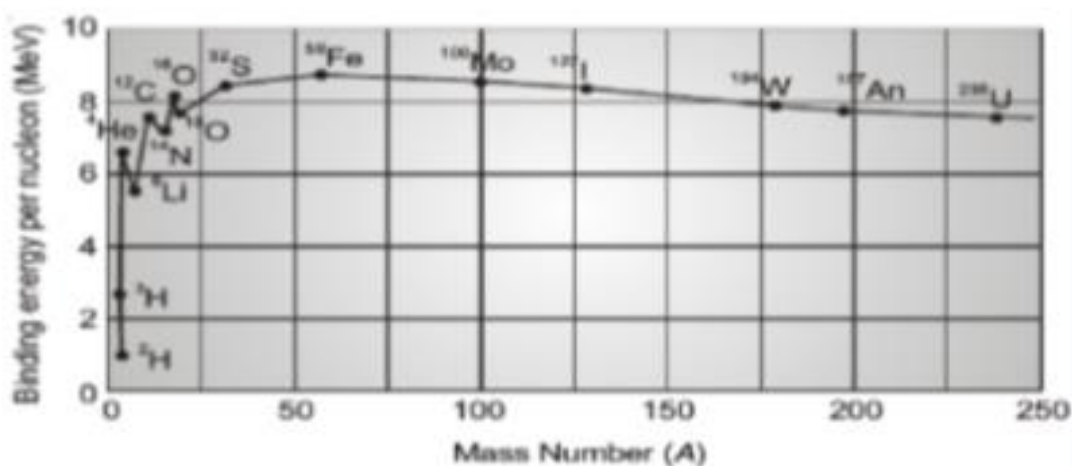
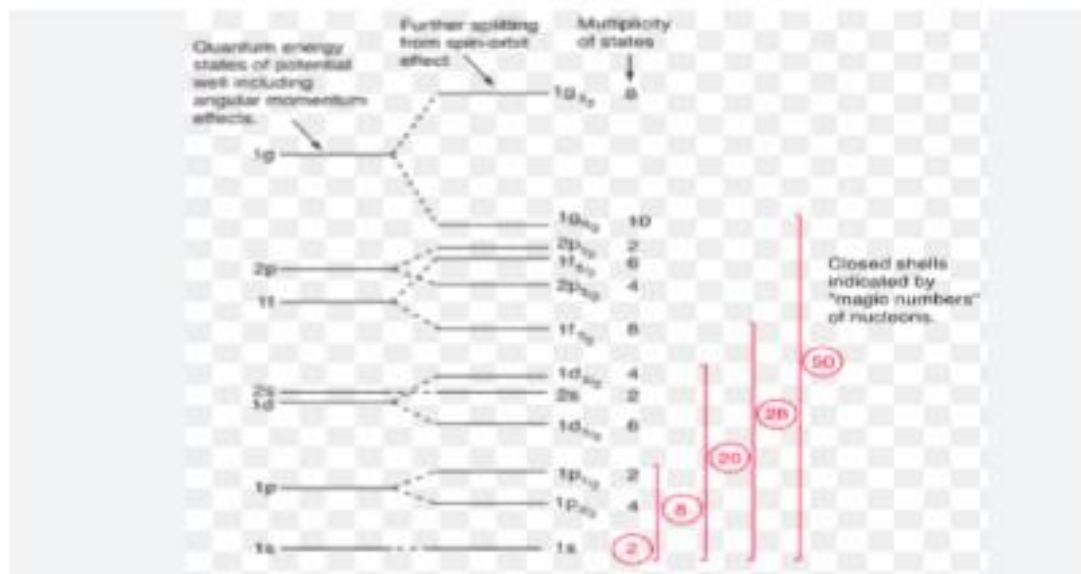


Fig.: The binding energy per nucleon as a function of mass number.

RELATION OF NUCLEAR SHELL STRUCTURE WITH MAGIC NUMBERS



Main Achievements of Shell Model

1. It explain the magic number.
2. It explain the magnetic moment of some nuclei.
3. It explain successfully ground state spin.
4. It explain 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 good agreement.

References

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...

jasminechem1@gmail.com

