Structure of Super-heavy element Z=117 *

M. Bhuyan[1,2], B. K. Sahu[3], and S. K. Patra[1]
[1] *Institute of Physics, Sachivalaya Marg, Bhubaneswar, India*
[2] *School of Physics, Sambalpur University, Jyotivihar, Burla, India and*
[3] *Institution-3(Department of Physics, Manikeswari collage, Sundargarh, India)*

The stability of nuclei in the superheavy mass region was predicted in mid sixties, when shell correction was added to the liquid drop binding energy. The possible shell closeres were predicted at Z=114 and N=184. However, in the last decade, using relativistic mean field (RMF) formalism, the next magic number beyond Z=82 and N=126 are predicted to be Z=120 and N=172/184 [1, 2]. The experimental confirmation of Z=118 [3], possible of Z=122 [4] from natural Th-isotopes and the synthesis of Z=117 [5] motivate us to study the structural properties of these nuclei. In the present abstract, in perticular, we report the properties of Z=117 isotopic chain, using the axially deformed (RMF) formalisms [6]. Here we calculate the binding energy, root-mean-square radius and quadrupole deformation parameter for Z=117 element. The isotopes are found to be deformed in their ground states. From the S_{2n} calculations, we also observed that sudden decrease of S_{2n} value in the isotopic mass chain indicate the possiblility of neutron close shell structure. From the binding energy analysis, we found that the most stable isotope in the series is $^{294}117$ considered to be a neutron-deficient nucleus. Our predicted α-decay energy Q_α and half-life time T_α agree nicely with the FRDM calculations [7], and available experimental data [5, 8, 9].

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* For more detail about this work contact:
M. Bhuyan
Email: bunuphy@iopb.res.in
Dr. S. K. Patra
Email: patra@iopb.res.in