CONCLUSION

Conclusion :

In the present work, the structure of the energy spectra and the backbending phenomena of the even-even Hf isotopes with mass number between 162 and 168 have been investigated. Analysis of the high-spin properties of these nuclei are given.

The gradual fall in 2_g^+ (ground state band) energy from 285 to 123.9 KeV, and the rise of $R_{42} = E_4/E_2$ from 2.56 to 3.11, the simple indicators of a shape transition, are reproduced in the present calculations. The cubic polynomial was used to illustrate the necessity of each of the three terms, viz., vibrational, rotational and perturbation ones, and to estimate the rotational energy content of the investigated bands :

^{162}Hf, R_{42} = 2.561 transition region I

^{164}Hf, R_{42} = 2.782 transition region 2, and

^{166}Hf, R_{42} = 2.975 transition region 2.

The energy levels are well reproduced for the various bands (positive parity and negative parity) in the three Hf isotopes (162, 164 and 166).

Similar calculations are performed by using Simple Model based on the variable moment of inertia for the observed bands in the series of the four Hf isotopes,

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