

Gamma spectroscopy with low-energy RIB: possibilities with ANURIB

In the first stage of ANURIB, low-energy rare isotope “beams” will be available to the users, which are ideal for the study of decay gamma spectroscopy. The decay spectroscopy of the neutron-rich nuclei are very important not only for the better understanding of the nuclear structure physics but has its implication in the applied field as well. Two aspects of the gamma spectroscopy, the Discrete gamma spectroscopy (DGS) and Total absorption gamma spectroscopy (TAGS) measurements which are used in the decay studies will be discussed. The TAGS measurement has been established as one of the most useful technique for proper estimation of beta-decay feeding intensity. The determination of beta-feeding intensity of the fission products is useful in reactor application to estimate its decay heat [1]. The recently suggested priority nuclei has been given in Ref.[1] for this application. It includes the neutron rich isotopes of Zr ($Z = 40$) to La ($Z = 57$). On the other hand, some of these nuclei in the $A \sim 140 - 150$ region are also interesting to study from nuclear structure physics point of view to investigate certain higher order correlation. The DGS, along with lifetime measurements of excited states in the daughter nuclei will be useful for such measurements. In the similar context, the decay study of neutron rich nuclei around ^{78}Ni are also of paramount interest.

At VECC, we have started a program of TAGS and DGS measurements of neutron rich nuclei. The TAGS and DGS measurements have been applied for initial studies of the decay of ^{43}K [2] and ^{126}Sb [3] at our centre. The measurements and the future possibilities with ANURIB will be presented.

References

- [1] A. L. Nichols, et al., Eur. Phys. J. A 59:78 (2023)
- [2] A. Dhal et al., EPJ Web of Conferences 146, 10013 (2017)
- [3] G. Mukherjee et al., Proc. of Abstracts in 5th International Conf. on Application of RadiotraCers and Energetic Beams in Sciences, ARCEBS-2023, Sidho-Kanho-Birsha Univ., Purulia, India (2023).

Primary author(s) : Dr MUKHERJEE, Gopal (Variable Energy Cyclotron Centre, 1/AF Bidhannagar, Kolkata 700064, INDIA)