Energy Depandence of Isomeric Yield Rations of Fission Products in 232Th + P System

I. 6. Energy Depandence of Isomeric Yield Ratios of Fission Products in ^{232}Th + p System

Goto S., Kaji D., Kudo H., Fujita M., Shinozuka T.* and Fujioka M.**

Department of Chemistry, Faculty of Science, Niigata University, Niigata Japan
*Cyclotron and Radioisotope Center, Tohoku University**

In nuclear fission process, the angular momentum of fission fragment provides much information about the saddle point configuration and/or the state shortly after the scission point configuration. Because an isomeric yield ratio which is defined as the yield ratio of a high spin isomer to that of low spin one, σ_h/σ_l, reflects directly the angular momentum, the isomeric yield ratio has been examined precisely in the present work.

Until now, isomeric yield ratios have been measured in a wide mass range for the system of 24 MeV proton-induced fission of ^{238}U[1] and ^{232}Th. In the present work, the isomeric yield ratio of ^{135}Xe in proton-induced fission of ^{232}Th was measured by the use of IGISOL in the proton energy range of 13 to 26 MeV. The determination of fission products was made by a gamma-ray spectrometry. The obtained radioactvities were converted to independent yields by correcting the amount of the feeding from parent nuclides, if any.

The obtained isomeric yield ratio of ^{135}Xe is shown in Fig. 1(a) as a function of the proton energy. It is found that the isomeric yield ratio increases with the proton energy. The same tendency has been found in other fragment masses and in other systems. In order to see the correlation of the isomeric yield ratio with the charge dispersion, the charge distribution of A=135 is determined. The result is shown in Fig. 1(b), where the fractional yield of ^{135}Xe is shown. It is found that the fractional yield increases with the proton energy except in the case of E_p=13 MeV. This indicates that the charge dispersion of fission fragments relates to the isomeric yield ratios. In the system of 13 MeV proton energy, despite of the relatively larger fractional yield, the isomeric yield ratio is smaller. The detailed analysis is now in progress.

Reference

1) Tanikawa M., et al., Z. Phys. **A347** (1993) 53.

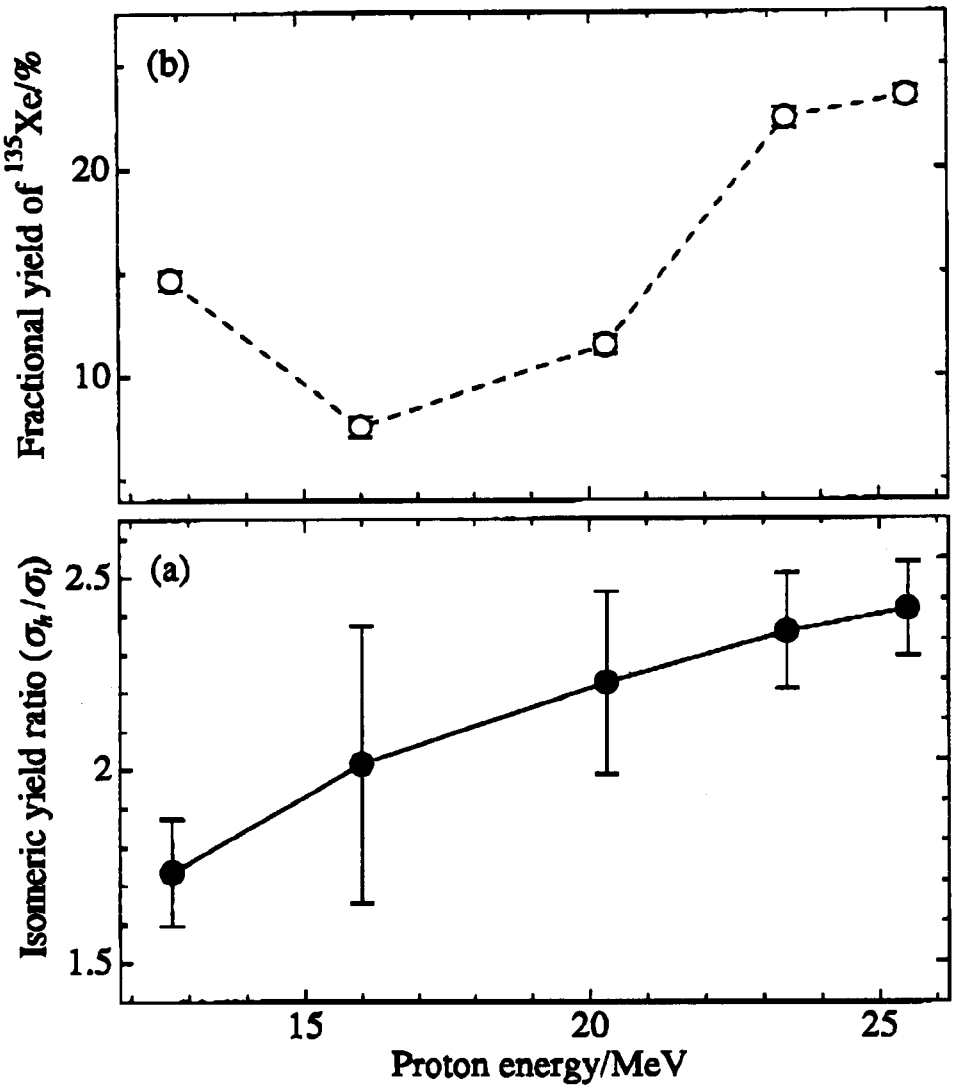

Fig. 1. A plot of isomeric yield ratios (a) and fractional yields (b) of ^{135}Xe against the proton energy in system of proton-induced fission of ^{232}Th.