Fission Fragment mass distribution in ^{195}Hg and ^{189}Os.

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Nuclear fission is a dynamic process involving large scale shape changes. Fission fragment mass distributions have been measured for many systems. The liquid drop model which was reasonably successful in explaining the fission process was not good enough to explain the mass distribution at lower energies for fission of nuclei in the mass region 228–258. The shell effects in the fragments were also required to explain fission fragment mass distribution. Hence at low to intermediate excitation energies, the fission of nuclei with mass around 264 were found to have symmetric mass splits leading to two doubly magic fragments having (A_{ff}∼132). Fission–fragment mass distributions are asymmetric in the fission of typical actinide nuclei for nucleon number A in the range 228–258 and proton number Z in the range 90–100. For lighter systems it has been observed that fission mass distributions are usually symmetric. However, a recent experiment showed that fission of ^{180}Hg following electron capture on ^{180}Tl is leading to asymmetric mass distribution [1]. Itkis *et al.* [2] have also observed a small dip in the low energy fission of nuclei in the mass region of 190–200. From fragment shell structure point of view, the nuclei in these mass region were expected to have symmetric fission. The recent calculation by Ichikawa *et al.* [3] indicates that the mechanism of asymmetric fission must be very different in these mass region compared to the actinide region. We have measured the fission fragment mass distribution for ^{13}C+^{182}W,^{176}Yb systems forming compound nucleus of ^{195}Hg and ^{189}Os respectively at 60, 63 and 66 MeV using the CUBE detector setup located at the ANU Pelletron accelerator facility. The analysis indicates that there is no asymmetric mass distribution for the systems studied. The results of the current study will be presented.

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