EVAPORATION RESIDUE CROSS-SECTION MEASUREMENTS FOR ^{48}TI+^{150,142}ND,^{144}SM SYSTEMS USING HYRA FACILITY

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It is well established that shell structure plays an important role for the production of super- heavy elements through fusion reaction. A considerable part of the excitation energy may be locked in rotation where the shell structure is more relevant. The same effect can also be observed with deformation. So, it is very interesting to study if there is any enhanced survival probability for evaporation residue (ER) cross-section in Z_{CN}=82 compound nucleus (CN). Also, it is necessary to disentangle the shell and deformation effect and understand it. With this motivation, ER cross- section measurements have been performed for ^{48}Ti+^{150,142}Nd,^{144}Sm systems using HYbrid Recoil mass Analyzer (HYRA) and ^{48}Ti beam from 15 UD Pelletron+LINAC accelerator facility at IUAC, New Delhi. ^{150}Nd is deformed (β_2=0.2681) while the other target ^{142}Nd is spherical (β_2=0.090) in ground state. By comparing the measurements of first two systems, deformation effect can be disentangled. In the third system, ^{144}Sm target is also spherical (β_2=0.0864), but leads to CN with Z_{CN}=84. Here, we can see the role of shell effect around Z_{CN}=82 by comparing the ER measurements of second and third system. Measurements were taken with pulsed ^{48}Ti beam at laboratory energies ranging from 185-270 MeV. In order to check the consistency of experimental results with theoretical ones, we have also performed statistical model calculations with Bohr- Wheeler (BW) formalism including shell correction in the level density and fission barrier. Initial results from statistical model calculations show an over prediction of ER cross-sections for ^{48}Ti+^{150,142}Nd,^{144}Sm systems.