

## Searching the Stabilizing Effects of Neutron Shell Closure via Fusion Evaporation Residue Studies

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**Abstract :** Searching the "Island of stability" is a topic of extreme interest in theoretical as well as experimental modern physics today. This "island of stability" is spanned by superheavy elements (SHE's) that are produced in the laboratory. SHE's are believed to exist primarily due to the "magic" stabilizing effects of nuclear shell structure. SHE synthesis is extremely difficult due to their very low production cross section, often of the order of pico barns or less. Stabilizing effects of shell closures at proton number  $Z=82$  and neutron number  $N=126$  are predicted theoretically. Though stabilizing effects of  $Z=82$  have been experimentally verified, no concluding observations have been made with  $N=126$ , so far. We measured and analyzed the total evaporation residue (ER) cross sections for a number of systems with neutron number around 126 to explore possible shell closure effects in ER cross sections, in this work.

**Keywords :** super heavy elements, fusion, evaporation residue, compound nucleus

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