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Cross-section measurement of the ^{85}Br(α,xn) and its implication in the weak r-process.[1] NABIN RIJAL, Michigan State Univ, HABANERO COLLABORATION — The fast-expanding neutron rich neutrino-driven winds in the core-collapse supernovae is one of the most favorable scenario for the nucleosynthesis of the Z = 38-47 elements. Charge particle reactions, especially (α,xn) on heavy nuclei of the range $80 < A < 90$ create seeds for the weak r-process populating abundances of near stable isotopes for the Sr-Cd range. These abundances are significantly sensitive to the (α,n) and (α,2n)reaction rates. Only very few of these (α,xn) reactions had been measured in the energy range relevant for weak r-process astrophysical conditions. Sensitivity studies of such scenario show that ^{85}Br(α,xn) is one of the most significant reaction to impact the abundances of the seeds to the weak r-process. To measure the cross-section of ^{85}Br(α,n) and (α,2n), the HABANERO detector is used, which is a neutron counter system that includes either BF_3 or ^{3}He gas-filled proportional counter tubes embedded in the matrix of polyethylene, designed to achieve somewhat constant and energy independent efficiency for neutrons up to 20 MeV. Preliminary results from the RIB experiment ^{85}Br(α,xn) along with brief details of the experimental setup will be presented.

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