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Fusion reactions of nuetron rich nuclei in dense matter[1] HELBER DUSSAN, CHARLES HOROWITZ — Fusion reactions play a key role in stellar evolution. The astrophysical S factor (or its associated fusion cross section) is important to know reaction rates, study chemical composition and temperature profiles of the star, as well as rate of production of heavy elements. There is not too much experimental information for the low energy fusion cross section of very neutron rich light nuclei. Using a simple barrier penetration model, we calculated the S factor for fusion reactions of neutron rich nuclei ($^{24}O +^{24} O$, $^{28}Ne +^{28} Ne$ and $^{12}C+$ a range of Oxygen isotopes up to ^{24}O). These results provide a lower limit for the fusion cross sections, since the dynamics of the neutron skin of neutron rich nuclei could enhance the penetration of the Coulomb barrier.

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