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Experimental evidence for a fusion enhancement in ^{19}O+^{12}C at near barrier energies[1] VARINDERJIT SINGH, T.K. STEINBACH, J. VADAS, B.B. WIGGINS, S. HUDAN, R.T. DESOUZA, Indiana University, L.T. BABY, V. TRIPATHI, S.A. KUVIN, I. WIEDENHOVER, Florida State University, A.S. UMAR, V.E. OBERACKER, Vanderbilt University — Fusion of neutron-rich light nuclei in the outer crust of an accreting neutron star has been proposed as responsible for triggering X-ray super-bursts. The underlying hypothesis in this proposition is that the fusion of neutron-rich nuclei is enhanced as compared to stable nuclei. To investigate this hypothesis, an experiment has been performed to measure the fusion excitation function for ^{18}O and ^{19}O nuclei incident on a ^{12}C target. A beam of ^{19}O was produced by the ^{18}O(d,p) reaction at Florida State University and separated using the RESOLUT mass spectrometer. The resulting ^{19}O beam bombarded a 100 μg/cm^2 ^{12}C target at an intensity of 2-4 x 10^4 p/s. Evaporation residues resulting from the de-excitation of the fusion product were distinguished by measuring their energy and time-of-flight. Evaporation residues were detected with high efficiency by measuring them in the angular range $4.4 \leq \theta_{lab} \leq 11.7$. The fusion cross-section has been measured down to 170 mb level. As compared to ^{18}O+^{12}C the fusion cross-section for ^{19}O+^{12}C is enhanced by approximately a factor of 3 times at the lowest energy measured. The measured excitation function will be compared with theoretical calculations.

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