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Enhancement of fusion at near-barrier energies for neutron-rich light nuclei: ^{19}O + ^{12}C[1] VARINDERJIT SINGH, J. VADAS, T. K. STEINBACH, B. B. WIGGINS, S. HUDAN, R. T. DESOUZA, Indiana Univ - Bloomington, L. T. BABY, S. A. KUVIN, VANDANA TRIPATHI, I. WIEDENHOVER, Florida State University, A. S. UMAR, Vanderbilt University — Measuring the fusion excitation function for an isotopic chain of projectile nuclei provides a sensitive test of a microscopic description of fusion. To investigate the theoretically predicted fusion enhancement for neutron-rich light nuclei, an experiment was performed to measure the fusion excitation functions for ^{19}O + ^{12}C and ^{18}O + ^{12}C. Using the ^{18}O(d,p) reaction and the RESOLUT mass spectrometer at Florida State University, a beam of ^{19}O was produced with an intensity of 2-4 x 10^3 p/s. This beam bombarded a 100 μg/cm^2 carbon target. Using an approach optimized for the measurement of fusion with a low-intensity beam, evaporation residues (ERs) resulting from the de-excitation of the fusion product were measured. The ERs were identified by measuring their energy and time-of-flight. At near-barrier energies, an enhancement of fusion by a factor of three has been observed for ^{19}O + ^{12}C in comparison to ^{18}O + ^{12}C. Comparison of the experimental results with the predictions of a density constrained time-dependent Hartree-Fock (DC-TDHF) model provide evidence for the importance of pairing in the fusion process.

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