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Alpha Emission in the De-excitation of ^{30}Si Nuclei at E* = 30 to 38 MeV[1] JUSTIN VADAS, TRACY STEINBACH, JON SCHMIDT, VARINDERJIT SINGH, SYLVIE HUDAN, ROMUALDO DESOUZA, Indiana University, LAGI BABY, SEAN KUVIN, INGO WIEDENHOVER, Florida State University — Compound nuclei produced in low-energy fusion reactions de-excite via emission of neutrons, protons, and alpha particles. Although the statistical model has been successful in describing this de-excitation for heavy nuclei, its applicability for light nuclei, particularly at low excitation is questionable. Understanding the de-excitation modes of such light nuclei is of significant importance as they play a role in stellar nucleosynthesis. To investigate this topic we have measured the alpha particles emitted in the de-excitation of the ^{30}Si nucleus produced by fusion of ^{18}O ions with ^{12}C target nuclei. Both the alpha particles and the coincident evaporation residues were identified by utilizing the energy versus time-of-flight method. The energy spectra and angular distributions of the residues reveal that alpha emission plays a significant role in the de-excitation of the compound nucleus. Comparison of the residue angular distributions and alpha particle yields and energy spectra with a statistical model shows that alpha emission is significantly under-predicted by the model. The details of this comparison and its possible implications will be presented.

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