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Two-neutron transfer reaction mechanisms in ^{12}C(^{6}He,^{4}He)^{14}C using a realistic three-body ^{6}He model[1] F. SARAZIN, D. SMALLEY, Colorado School of Mines, F.M. NUNES, B.A. BROWN, Michigan State University / NSCL, TIGRESS COLLABORATION, SHARC COLLABORATION — The reaction mechanisms of the two-neutron transfer reaction ^{12}C(^{6}He,^{4}He) have been studied at $E_{lab} = 30$ MeV at the TRIUMF ISAC-II facility using the Silicon Highly-segmented Array for Reactions and Coulex (SHARC) inside the TRIUMF-ISAC Gamma-Ray Escape-Suppressed Spectrometer (TIGRESS). In the past, the two-neutron transfer (^{6}He,^{4}He) angular distributions were often analyzed as a one-step process using a simple di-neutron plus core configuration for the ^{6}He nucleus. In this work, the transfer angular distribution to the 2_2^+ 8.32 MeV state in ^{14}C is studied using a realistic 3-body ^{6}He model and advanced shell model calculations for the carbon structure, allowing to calculate the relative contributions of the simultaneous and sequential two-neutron transfer. The reaction model provides a good description of the data set and shows that while the simultaneous process is the dominant transfer mechanism, the sequential transfer contribution cannot be neglected.

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