**Study of the** $^{13}\text{C}(d,n^{0,1})^{14}\text{N}$ **reaction below** $E_{cm} = 400$ keV **ERIC CLINTON, M.W. AHMED, S.S. HENSHAW, B.A. PERDUE, Duke/Triangle Universities Nuclear Laboratory, P.N. SEO, TUNL, UConn, and UMass Amherst, S. STAVE, H.R. WELLER, Duke/Triangle Universities Nuclear Laboratory, P.P. MARTEL, University of Massachusetts Amherst, R.H. FRANCE III, Georgia College & State University, R.M. PRIOR, M.C. SPRAKER, North Georgia College & State University — Several poorly understood reactions may contribute to heavy element inhomogeneous nucleosynthesis. Among these reactions, $^{13}\text{C}(d,n)$ has been studied in order to better understand the dynamics of this reaction and the proper way to extrapolate its S-factor. We have made detailed measurements of the angular distributions of the cross sections and the vector analyzing power for the $n_0$ and the $n_1$ reaction groups in the $E_{cm}$ range from 250 to 400 keV. The atomic beam polarized ion source and the TUNL mini-tandem supplied polarized deuterium beams which struck a thick, enriched $^{13}\text{C}$ target. Nine organic liquid scintillator (BCI-501) neutron detectors were placed at forward and backwards angles. Angular coverage was from $0^\circ$ to $158^\circ$ with two detectors at $\pm 90^\circ$ to control systematic effects. The data will be compared to the predictions of the direct reaction model.

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