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Study of fusion evaporation channels in the 18 O+ 18 O reaction at 65 MeV

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<p>The fusion evaporation reaction is mainly used to populate high spin states in atomic nuclei. Using stable beams, a large number of β + unstable nuclei were studied i.e. those nuclei on the neutron deficient side of the valley of stability. A plethora of experimental data is available in a wide range of mass A ~ 20 to A ~ 250 and was used to test the statistical model codes such as PACE, CASCADE, GEMINI. With the advent of radioactive beams, a new landscape will be available to provide further tests to the models. However, a study of fusion evaporation reactions will only be possible with sufficient beam intensities. In this research β – unstable nuclei were populated with one of the few reactions where nuclei approaching the neutron rich region can be populated with stable beams. Due to the relatively low Coulomb barrier the evaporation of charged particles is a relatively strong channel. The DIAMANT light charged particle detector was set in coincidence with the AFRODITE ɣ-ray spectrometer to trigger between light charged particles and ɣ-rays. The coincident data allows the evaporation channels involving p, d, t and particles to be identified due to excellent particle identification with the CsI charged particle detectors while the A, Z of the residual nuclei are identified with the gamma transitions measured with germanium detectors. In this work, the cross sections of the residual nuclei were calculated with the statistical model code CACARIZO, a Monte Carlo version of CASCADE based on the Hauser-Feshbach formalism. Experimental and theoretical results and charged particle energy spectra are compared.

Level (Hons, MSc,
   PhD, other)?

PhD

Consider for a student
   award (Yes / No)?

Yes

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Primary author: Ms KHALEEL, ESRA (Stellenbosch University)

Co-authors: Dr PAPKA, Paul (Stellenbosch University); Dr MULLINS, Simon (iThemba LABS)

Presenter: Ms KHALEEL, ESRA (Stellenbosch University)

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