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A Study of the ^{30}S(α,p)^{33}Cl Reaction Rate[1] C.M. DEIBEL, Argonne National Laboratory (ANL), Joint Institute for Nuclear Astrophysics, C.L. JIANG, B.P. KAY, H.Y. LEE, R.C. PARDO, K.E. REHM, C. UGALDE, A. WOODARD, ANL, J.M. FIGUEIRA, U.A. Fisica, S.T. MARLEY, ANL, Western Michigan University (WMU), N.R. PATEL, ANL, Colorado School of Mines, M. PAUL, Hebrew University, A. WUOSMAA, WMU — The ^{30}S(α,p)^{33}Cl reaction rate has major implications for x-ray bursts (XRBs). No experimental information exists for this reaction rate, though XRB models have shown that it affects final isotopic abundances and the total energy output.[2] This rate may also influence XRB observables such as the structure of double-peaked luminosity curves[3] and the composition of the neutron star crust.[4] We have studied the time-inverse reaction p(^{33}Cl,^{30}S)α at ATLAS using a radioactive ^{33}Cl beam. The residual ^{30}S nuclei were detected at the focal plane of the split-pole spectrograph, which was used in gas-filled mode, in coincidence with the α particles, which were detected in a double-sided Si detector. The experimental results and conclusions about the impact on XRB nucleosynthesis will be discussed.

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[2]A. Parikh *et al.*, ApJ SS **178**, 110 (2008).
[3]J.L. Fisker *et al.*, ApJ **608**, L61 (2004).
[4]H. Schatz and K.E. Rehm, NPA **777**, 601 (2006).

Catherine Deibel
Argonne National Laboratory, Joint Institute for Nuclear Astrophysics

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