

Abstract Submitted
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Measurement of Low Energy Resonances in $^{31}\text{P}(p,\alpha)^{28}\text{Si}$ B.H. MOAZEN, Univ. of Tenn, C. MATEI, ORAU, D.W. BARDAYAN, ORNL, J.C. BLACKMON, LSU, K.Y. CHAE, Univ. of Tenn., K.A. CHIPPS, Colorado School of Mines, R. HATARIK, Rutgers, K.L. GRZYWACZ, R.W. KAPLER, Univ. of Tenn., R.L. KOZUB, Tenn. Tech. Univ., M. MATOS, LSU, C.D. NESARAJA, S.D. PAIN, Univ. of Tenn./ORNL, T. PELHAM, Univ. of Surrey, W.A. PETERS, Rutgers, S.T. PITTMAN, Univ. of Tenn., J.F. SHRINER JR., Tenn. Tech. Univ., M.S. SMITH, ORNL — The (p,α) reactions on $T=1/2$ nuclei like ^{23}Na , ^{27}Al , ^{31}P , and ^{35}Cl , and the competing (p,γ) reactions are important for understanding the reaction flow to heavier elements in the rp-process. Previous rate calculations of the $^{31}\text{P}(p,\alpha)^{28}\text{Si}$ reaction were based on indirect information gained from studies of the $^{31}\text{P}(^3\text{He},d)^{28}\text{S}$ reaction [1]. At ORNL, we measured the energy and strength of the 371 and 599 keV resonances in $^{31}\text{P}(p,\alpha)^{28}\text{Si}$ using a technique previously employed for an $^{17}\text{O}(p,\alpha)^{14}\text{N}$ study[2]. A beam of ^{31}P bombarded hydrogen gas which filled a large, differentially pumped scattering chamber at a pressure of 3 Torr. The alpha particle and ^{28}Si recoil were detected in coincidence and the reaction vertex was determined using the relative kinematics of the reaction products. The experimental setup and preliminary results will be presented. [1] Ross *et al.*, Phys. Rev C 52, 1681 (1995) [2] B. H. Moazen *et al.*, Phys. Rev. C 75, 065801 (2006) ORNL is managed by UT-Battelle for the US DOE

B.H. Moazen
Univ. of Tenn.

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