

Abstract Submitted
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The Beta Delayed Proton and Gamma Decay of ^{27}P For Nuclear Astrophysics¹ E. SIMMONS, TAMU Cyclotron Institute, L. TRACHE, A. BANU, M. MCCLESKEY, B. ROEDER, A. SPIRIDON, R.E. TRIBBLE, T. DAVINSON, P.J. WOODS, G.J. LOTAY, J. WALLACE, D. DOHERTY, A. SAAS-TAMOINEN — The creation site of ^{26}Al is still under debate. It is thought to be produced in hydrogen burning and in explosive helium burning in novae and supernovae, and possibly also in the H-burning in outer shells of red giant stars. Also, the reactions for its creation or destruction are not completely known. When ^{26}Al is created in novae, the reaction chain is: $^{24}\text{Mg}(p,\gamma)^{25}\text{Al}(\beta+\nu)^{25}\text{Mg}(p,\gamma)^{26}\text{Al}$, but this chain can be by-passed by another chain: $^{25}\text{Al}(p,\gamma)^{26}\text{Si}(p,\gamma)^{27}\text{P}$ and it can also be destroyed directly. The reaction $^{26m}\text{Al}(p,\gamma)^{27}\text{Si}^*$ is another avenue to bypass the production of ^{26}Al and it is dominated by resonant capture. We study these resonances by an indirect method, through the β -decay of ^{27}P . We use ^{27}P produced and separated with MARS and a setup which allows increased efficiency for low energy protons and for high-energy gamma-rays. We measure gamma-rays and β -delayed protons emitted from states above the proton threshold in the daughter nucleus ^{27}Si ($S_p = 7.463$ MeV) to identify and characterize the resonances. Its lifetime was also measured with accuracy under 1%.

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