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Experimental Results of the ^{33}S(α,p)^{36}Cl Cross Sections: Implications on ^{36}Cl Production in the Early Solar System MATTHEW BOWERS, PHILIPPE COLLON, YOAV KASHIV, WILLIAM BAUDER, WENTING LU, KAREN OSTDIEK, University of Notre Dame — Isotopic measurements of primitive solids in meteorites provide insight into the origins of the Solar System, the chemical evolution of the elements, and nucleosynthetic processes. Identifying the origins of now-extinct short-lived radionuclides (SLRs) is important for both Early Solar System chronology and nuclear astrophysics. The origin of extinct ^{36}Cl in the early Solar System is thought to have been produced by irradiation of gas and dust by solar energetic particles emitted by the young Sun. Attempts to recreate the production of ^{36}Cl in the early Solar System using the x-wind model lack experimental data for the nuclear reactions considered. We measured the cross sections for the ^{33}S(α,p)^{36}Cl reaction, an important reaction in the production of ^{36}Cl, at six energies that ranged from 0.70-2.42 MeV/A. The cross section measurement was performed by bombarding a target and collecting the recoiled ^{36}Cl atoms produced in the reaction, chemically processing the samples, and measuring the ^{36}Cl/Cl concentration with AMS. The experimental procedure, results, and comparison with predicted Hauser-Feshbach predictions will be discussed.

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