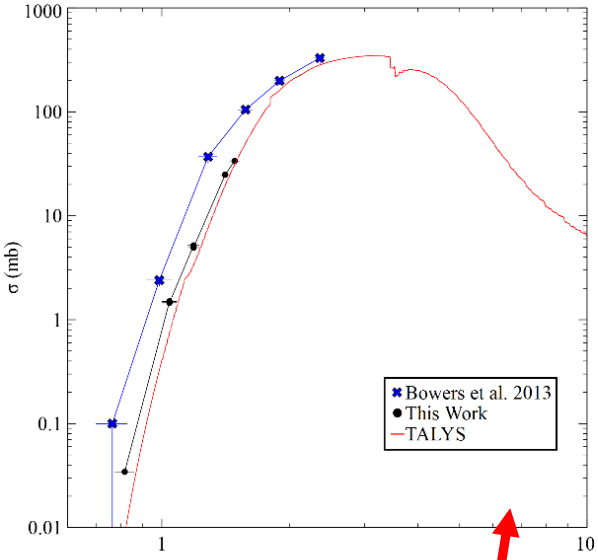
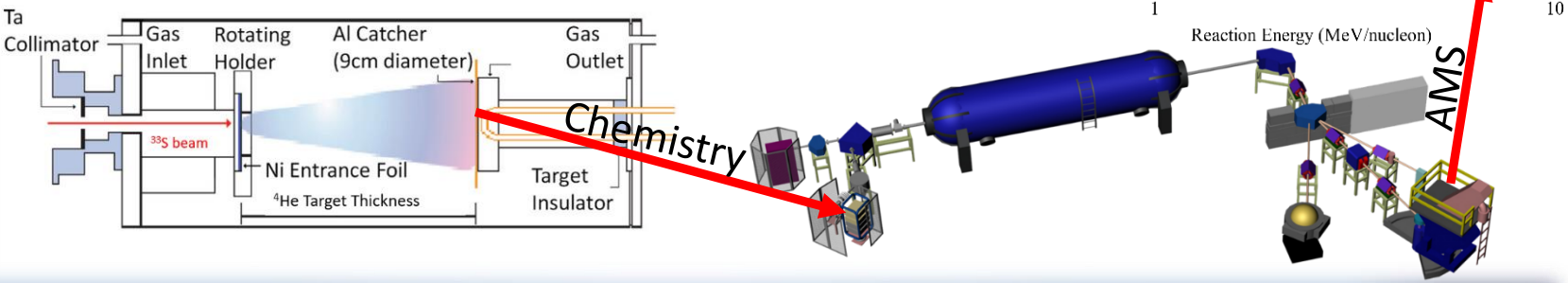
Re-measurement of the $^{33}S(\alpha,p)^{36}Cl$ cross section for early solar system nuclide enrichment

The presence of many radionuclides in the early solar system is inferred from excesses in their decay products found in meteorites. These isotopes, including ^{36}Cl, are referred to as short-lived radionuclides (SLRs) compared to the age of the solar system, and studying the observed excesses can give important insights in to processes taking place during the formation of the solar system and their timescales. To fully utilize SLRs for this purpose, however, their production sources and mechanisms must be well understood.

To that end, ^{36}Cl was produced through activations at five energies between 0.78 and 1.52 MeV/nucleon. After chemical extraction, the samples were measured with Accelerator Mass Spectrometry to determine the reaction cross sections. Improvements were made on past measurements with new methods to reduce sample losses and increase precision of reaction energies. These measurements add to the currently limited library of experimentally measured cross sections relevant to early solar system nuclide enrichment, reducing the reliance of early solar system models on nuclear theory.





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