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Investigation of the ^{30}S$(p,\gamma)^{31}$Cl reaction via Coulomb dissociation YASUHIRO TOGANO, RIKEN Nishina Center, RNC R403N COLLABORATION — The Stellar reaction ^{30}S$(p,\gamma)^{31}$Cl was studied via Coulomb dissociation. The nucleus ^{30}S is a candidate for the waiting point, which the reaction flow temporary stops at this nuclei, in the rapid proton capture (*rp*) process. The ^{30}S$(p,\gamma)^{31}$Cl reaction decreases the amount of ^{30}S, and thus speeds the reaction flow of the *rp* process up. Therefore the strength of this reaction affects the resultant abundance and energy production in the *rp* process. No direct measurement of the ^{30}S$(p,\gamma)^{31}$Cl reaction has been made so far. The aim of the present work is to determine the resonant capture reaction rate of ^{30}S$(p,\gamma)^{31}$Cl from the result of Coulomb dissociation of ^{31}Cl. The experiment was performed at the RIKEN Nishina Center. The secondary beam of ^{31}Cl at 58 MeV/nucleon was produced and separated using the RIKEN Projectile Fragment Separator (RIPS). The beam of ^{31}Cl bombarded a ^{208}Pb target. The momentum vectors of the breakup products, the isotopes ^{30}S and protons, were determined using the detectors located at downstream of the target. The relative energy spectrum of ^{30}S + p system was extracted using invariant-mass method. In this presentation, we discuss the unbound state of ^{31}Cl which is relevant to the resonant capture in the ^{30}S$(p,\gamma)^{31}$Cl reaction.

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