

## Direct measurement of the $^{26}\text{Si}(\alpha, p)^{29}\text{P}$ reaction for the nucleosynthesis in the X-ray bursts

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In the X-ray bursts, the  $\alpha p$ -process, that consists of alternating ( $\alpha, p$ ) and ( $p, \gamma$ ) reactions, is considered to have a great impact on the light curve. However, most of the important reactions have not been understood experimentally because of technical difficulties. The  $^{26}\text{Si}(\alpha, p)^{29}\text{P}$  reaction rate is one of the  $\alpha p$ -process reactions and it is considered that the reaction rate has high sensitivity to the X-ray burst light curve. Therefore, a direct measurement of the reaction was performed at the CNS RI beam separator (CRIB). CRIB produced a  $^{26}\text{Si}$  beam with a typical intensity of  $3.2 \times 10^4$  pps and a purity of 29%, which bombarded the  $^4\text{He}$  gas target. We measured the reaction particles using five telescopes consisting of three and four silicon detectors. The  $^{26}\text{Si}(\alpha, p)^{29}\text{P}$  reaction was measured up to the center-of-mass energy of about 7.5 MeV, corresponding to about 3 GK of Gamow energy, using the thick gas target method. Because of insufficient statistics, the statistical error became large but an upper limit on the cross section was obtained, which was 0.134 times that of the NON-SMOKER statistical model. The results are useful for comparing experimental and theoretical values at higher temperatures and for constraining the  $^{26}\text{Si}(\alpha, p)^{29}\text{P}$  reaction rate. The analysis method and the results will be discussed.

**Primary authors:** OKAWA, Kodai; KIM, Minju (Department of Physics, Sungkyunkwan University); CHAE, Kyungyuk (Department of Physics, Sungkyunkwan University); HAYAKAWA, Seiya (Center for Nuclear Study, the University of Tokyo); ADACHI, Satoshi (Department of Physics, Osaka University); CHA, Soomi (Center for Exotic Nuclear Studies, Institute for Basic Science (IBS) ); CHILLERY, Thomas William (Center for Nuclear Study, the University of Tokyo); FURUNO, Tatsuya (Department of Physics, Osaka University); GU, Gyungmo (Department of Physics, Sungkyunkwan University); HANAI, Shutaro (Center for Nuclear Study, the University of Tokyo); IMAI, Nobuaki (Center for Nuclear Study, the University of Tokyo); KAHL, David (Extreme Light Infrastructure Nuclear Physics (ELI-NP) ); KAWABATA, Takahiro (Department of Physics, Osaka University); KIM, Chanhee (Department of Physics, Sungkyunkwan University); KIM, Dahee (Center for Exotic Nuclear Studies, Institute for Basic Science (IBS) ); KIM, Sohyun (Department of Physics, Sungkyunkwan University); KUBONO, Shigeru (RIKEN Nishina Center); KWAG, Minsik (Department of Physics, Sungkyunkwan University); LI, Jiatai (Center for Nuclear Study, the University of Tokyo); MA, Nanru (Center for Nuclear Study, the University of Tokyo); MICHIMASA, Shin'ichiro (Center for Nuclear Study, the University of Tokyo); NGUYEN KIM, Uyen (Department of Physics, Sungkyunkwan University); NGUYEN NGOC, Duy (Department of Physics, Sungkyunkwan University); SAKANASHI, Kohsuke (Department of Physics, Osaka University); SHIMIZU, Hideki (Center for Nuclear Study, the University of Tokyo); SIRBU, Oana (Extreme Light Infrastructure Nuclear Physics (ELI-NP) ); YAMAGUCHI, Hidetoshi (Center for Nuclear Study, the University of Tokyo); YOKOYAMA, Rin (Center for Nuclear Study, the University of Tokyo); ZHANG, Qian (Center for Nuclear Study, the University of Tokyo)

**Presenter:** OKAWA, Kodai

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