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Performance test of the $Gd_3Al_2Ga_3O_{12}$ (GAGG) scintillator for the nuclear astrophysics experiment AMI KOSHIKAWA, SATOSHI ADACHI, TATSUYA FURUNO, TAKAHIRO KAWABATA, MIHO TSUMURA, Department of Physics, Kyoto University, SHUNSUKE KUROSAWA, Institute for Materials Research (IMR), Tohoku University — The γ-decay widths of the excited states in ^{12}C are very important quantities to understand the nucleosynthesis in the universe, but the γ-decay widths for the 3_1^- and 2_2^+ states in ^{12}C have never been measured. To determine the γ-decay widths of the 3_1^- state, we propose to measure the ^{1}H(^{12}C, ^{12}C*p) reaction under the inverse kinematics condition. The energies and emission angles of the scattered ^{12}C and the recoil proton will be measured by the magnetic spectrometer Grand Raiden and the Si-CsI counter telescope, respectively. We carried out a test experiment at RCNP, Osaka and found that the energy resolution of the CsI detector is poorer than expected due to the high counting rate. To solve the pile-up problem in the recoil proton detector, we have started the performance test of the Ce-doped $Gd_3Al_2Ga_3O_{12}$ (GAGG) scintillator. The Ce-doped GAGG was recently developed and it has better light output and shorter scintillation decay time than CsI. In the present talk, the results of the performance test of the Ce-doped GAGG scintillator will be reported.

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