

MEASUREMENT OF ${}^4\text{He}$ (${}^{12}\text{C}$, ${}^{16}\text{O}$) γ TOTAL CROSS SECTION DOWN TO $E_{\text{cm}} = 1.0$ MeV AT KUTL

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${}^{12}\text{C}+{}^4\text{H}\rightarrow{}^{16}\text{O}+\gamma$ at $E_{\text{cm}}=0.3$ MeV is one of the two key reactions in helium burning in stars, and determines C/O abundance ratio which is important for nucleosyntheses. However, measurement of ${}^{12}\text{C}+{}^4\text{H}\rightarrow{}^{16}\text{O}+\gamma$ total cross section is very difficult, and has not been succeeded yet in spite of experimental efforts for about 45 years [1].

At Kyushu University Tandem accelerator Laboratory (KUTL), measurement of ${}^{12}\text{C}+{}^4\text{He}\rightarrow{}^{16}\text{O}+\gamma$ total cross section has been made at $E_{\text{cm}}=2.4$ and 1.5 MeV and is being made at 1.2 MeV. The cross section at 1.0 MeV (about 0.1 nbarn) will be measured in 2014. The measured data and experimental techniques are presented, together with a plan to measure the cross section down to 0.7 MeV.

[1] D. Schürmann et al., *Eur. Phys. J. A* 26, 301 (2005)