



ID de la contribución : 924

Tipo : no especificado

Measurement of $^{27}\text{Al}(\alpha, n)^{30}\text{P}$ reaction cross-section at CMAM using the miniBELEN neutron counter

martes, 19 de noviembre de 2024 14:45 (15)

The production of neutrons through α -induced reactions play an important role in fields such as nuclear astrophysics, underground laboratories, fission and fusion reactors and non-destructive assays for non-proliferation and spent fuel management applications. However, most of the currently available experimental data was measured decades ago, is incomplete and/or present large discrepancies not compatible with the declared uncertainties. New measurements addressing the actual needs are, therefore, required [1]. To that end the Measurement of Alpha Neutron Yields and spectra (MANY) collaboration was formed.

MANY is a coordinated effort aiming to carry out measurements of (α, n) production yields, reaction cross-sections and neutron energy spectra. The project relies on the use of the α -beams produced by the accelerators at CMAM (Madrid) [2] and CNA HiSPANoS (Sevilla) [3,4]. The measurements are carried out using different types of neutron detection systems, including the miniBELEN neutron counter [5], the MONSTER time-of-flight spectrometer [6] and the GARY array of gamma detectors [7].

In this work we report the definitive results of the measurement of the $^{27}\text{Al}(\alpha, n)^{30}\text{P}$ thick target neutron yields from 3.8 MeV up to 8 MeV. The measurement has been carried out at CMAM using the miniBELEN neutron counter. The reaction cross-sections have been obtained from the measured yields and the available stopping power data.

Bibliography

- [1] A. Junghans, S.S. Westerdale, P. Dimitriou, IAEA technical meeting INDC(NDS)-0894 (2023).
- [2] J. Gómez-Camacho et al, EPJ Plus 136:275 (2021)
- [3] M. A. Millán-Callado et al., Rad. Phys. And Chem. (2024) 111464
- [4] A. Redondo-Cubero et al., EPJ Plus 136:175 (2021)
- [5] N Mont-Geli et al. EPJ Web of Conferences 284 (2023) 06004
- [6] A R Garcia et al. Journal of Instrumentation 7 (2012) C05012
- [7] L.M. Fraile et al. in NDC(NDS)-0894 (2024)

Abstract

Primary author(s): MONT I GELI, Nil (Universitat Politècnica de Catalunya); TARIFEÑO-SALDIVIA, Ariel (Instituto de Física Corpuscular (CSIC-UV)); Dr. FRAILE, Luis Mario (Universidad Complutense de Madrid); VIÑALS ONSÈS, Sílvia (CSIC - IEM); PEREA MARTINEZ, Angel (IEM/CSIC); PALLÀS SOLÍS, Max (Universitat Politècnica de Catalunya (UPC)); CORTES ROSSELL, Guillem (Universitat Politècnica de Catalunya. Dep. Física i Enginyeria Nuclear); Dr. GARCÍA, Gastón (Universidad Autónoma de Madrid (UAM)); NACHER, Enrique (Instituto de Física Corpuscular - CSIC); TAIN, Jose L. (Instituto de Física Corpuscular); ALCAYNE AICUA, Victor (CIEMAT (Spain)); ALONSO-SAÑUDO, Odette (Universidad Complutense de Madrid); ALGORA, Alejandro (IFIC (CSIC-Univ. Valencia)); Sr. AUÑÓN, Gabriel (Universidad de Sevilla); BALIBREA CORREA, Javier (Instituto de física

corpuscular IFIC)

Presenter(s) : MONT I GELI, Nil (Universitat Politècnica de Catalunya)

Clasificación de la sesión : Red FNUC (Red Temática de Física Nuclear)

Clasificación de temáticas : Red Temática de Física Nuclear (FNUC)