

Status of experimental and evaluated discrete γ -ray production in (N,X) reactions at $E_n=14.1$ MeV for ^{12}C , ^{16}O , ^{28}Si

Cross-sections of the γ -ray production in neutron-induced reactions are needed in many practical fields: design of nuclear and thermonuclear reactors, elemental analysis and modeling of various nuclear setups. Besides this they provide valuable information base for understanding the nuclear structure and mechanisms of nuclear reactions. In the Frank Laboratory of Neutron Physics, the international project TANGRA is being implemented to study the scattering of tagged 14.1 MeV neutrons on atomic nuclei. For this project it is very important to have a comprehensive and detailed information of present status of experimental and evaluated data on photon production cross sections, showing for what nuclei and with what accuracy the γ production cross-sections have been measured and how they are predicted by widely used evaluated data libraries. To date, the most comprehensive compilation for this kind of information was created in 1998[1], so it is important to include and review results of modern experiments. A promising way to do that is analysis of data from EXFOR[2]. In this work we have developed specific techniques for extraction and processing data available in EXFOR. As a result of the work we will provide our review of experimental data for ^{12}C , ^{16}O and ^{28}Si nuclei and updated recommended values of γ -ray production cross-sections.

1. Simakov, S.P., Pavlik, A., Vonach, H., & Hlavac, S. (1998). Status of experimental and evaluated discrete γ -ray production at $E_n=14.1$ MeV Final report of Research Contract 7809/RB, performed under the CRP on measurement, calculation and evaluation of photon production data (INDC(CCP)-413). International Atomic Energy Agency (IAEA)
2. Experimental Nuclear Reaction Data (EXFOR), <https://www-nds.iaea.org/exfor>

Section

Nuclear structure: theory and experiment

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