
EXPERIMENTAL CROSS SECTION DATA BASE SELECTION BY A SAMMY REICH-MOORE PARAMETERISATION OF THE RESOLVED RESONANT RANGE: THE CASE OF THE ${}^9\text{Be}(\alpha, \text{n})$ CROSS SECTION UP TO 6 MEV.

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The ${}^9\text{Be}(\alpha, \text{n}){}^{12}\text{C}$ reaction has been of importance as a source of accelerator- or α -decay produced neutrons and is still of importance for other applications like astrophysics (neutron production reactions in stars), reactor start-up or diagnostics. Experimental campaigns have been performed periodically on this reaction, essentially in the sixties, the seventies and more recently in the nineties. The corresponding database is one of the most exhaustive among the (α, n) reactions on light nuclei but still contains conflicting data sets, sometimes by more than a factor of two.

In order to clarify the experimental situation and to produce a complete evaluation of the reaction (up to 6 MeV), a Reich-Moore parameterisation of the data has been performed by using the latest version of the SAMMY code which now handles input-output charged-particles data, with the kind assistance of N. Larson, ORNL. From the information available in the literature and from a large variety of experimental data sets (integrated and angular ${}^9\text{Be}(\alpha, \text{n}){}^{12}\text{C}$ cross sections, neutron total cross sections on ${}^{12}\text{C}$, elastic scattering of α particles on ${}^9\text{Be}$), a full consistent Reich-Moore parameter data set has been generated up to 6 MeV for the first time. This paper describes the successive steps involved and the difficulties met during this work.