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# $^{16}$O(n,$\alpha_0$)$^{13}$C Cross Section Normalization based on a new Time-of-Flight measurement using a Frisch Grid Ionisation Chamber.

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A $^{16}$O(n,$\alpha$)$^{13}$C reaction cross section measurement was carried out at the time-of-flight facility GELINA using a Frisch-grid ionization chamber built by HZDR. Between the reaction threshold (2.36 MeV) and a neutron energy of 9 MeV, $^{16}$O(n,$\alpha_0$)$^{13}$C events could be separated well from background events.
The experimental $^{16}$O(n,$\alpha_0$)$^{13}$C data are normalized relative to the neutron-induced fission cross section of $^{235}$U of the neutron data standards using the H19 transfer instrument of PTB Braunschweig.
Applying the principle of detailed balance, cross sections measured for the $^{13}$C($\alpha$,n$_0$)$^{16}$O reaction (from Bair and Haas, Sekharan and Harissopulos)
above E$_\alpha$=1 MeV, are converted to $^{16}$O(n,$\alpha_0$)$^{13}$C cross section data and has been normalized to the cross-section integral over of the measured data from 4.0 to 5.3 MeV.
Evaluated $^{16}$O(n,$\alpha$)$^{13}$C data could be normalized as well.
An alternative normalization for the evaluated cross sections and $^{13}$C($\alpha$,n)$^{16}$O data which is based on the $^{13}$C($\alpha$,n$_0$)$^{16}$O thick target yield data of West and Sherwood is also presented and has an uncertainty of 8%. The data by West and Sherwood, used for this normalization are supported by two additional mutually consistent independent thick-target yield measurements.
The two sets of normalization factors agree within 3%.

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