



Doctoral Thesis

Aufbruch von Deuteronen mit 14,1-MeV-Neutronen

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Aufbruch von Deuteronen mit 14,1-MeV-Neutronen

ABHANDLUNG

zur Erlangung der Würde eines Doktors der Naturwissenschaften
der
EIDGENÖSSISCHEN TECHNISCHEN HOCHSCHULE
ZÜRICH

vorgelegt von

MAX BRÜLLMANN

dipl. Phys. ETH

geboren am 26. März 1932

von Hefenhofen (Kt. Thurgau)

Angenommen auf Antrag von

Prof. Dr. P. Marmier, Referent

Prof. Dr. E. Sheldon, Korreferent

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SUMMARY

Using a fast time-of-flight spectrometer, the neutron spectra $d^2\sigma/d\Omega dE$ of the reaction $D(n,2n)H$ have been measured at an incident energy of 14.1 MeV. The investigation was carried out for eight angles lying between 7.5° and 75° , in the energy range of 2 MeV and the upper limit of the continuous distribution. At small angles, the peaks appearing in the central part and at the upper limit of the spectrum can be explained by means of the final state interaction between the break-up nucleons. The structure of the spectrum decreases at larger angles, the peaks disappearing almost completely for $\theta_{lab} > 30^\circ$. The differential break-up cross section $d\sigma/d\Omega$ is obtained by integration of the break-up spectra over the given energy range. For the emission of neutrons in the forward hemisphere, the total cross section was found to be $\sigma_V = 255 \pm 30$ mb. The results have been compared with various theoretical and experimental values.