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A STUDY OF NUCLEAR COLLISIONS OF 86 MeV/a.m.u. ^{12}C WITH HEAVY TARGETS BY COLLECTION OF THE HEAVY RECOIL NUCLEI

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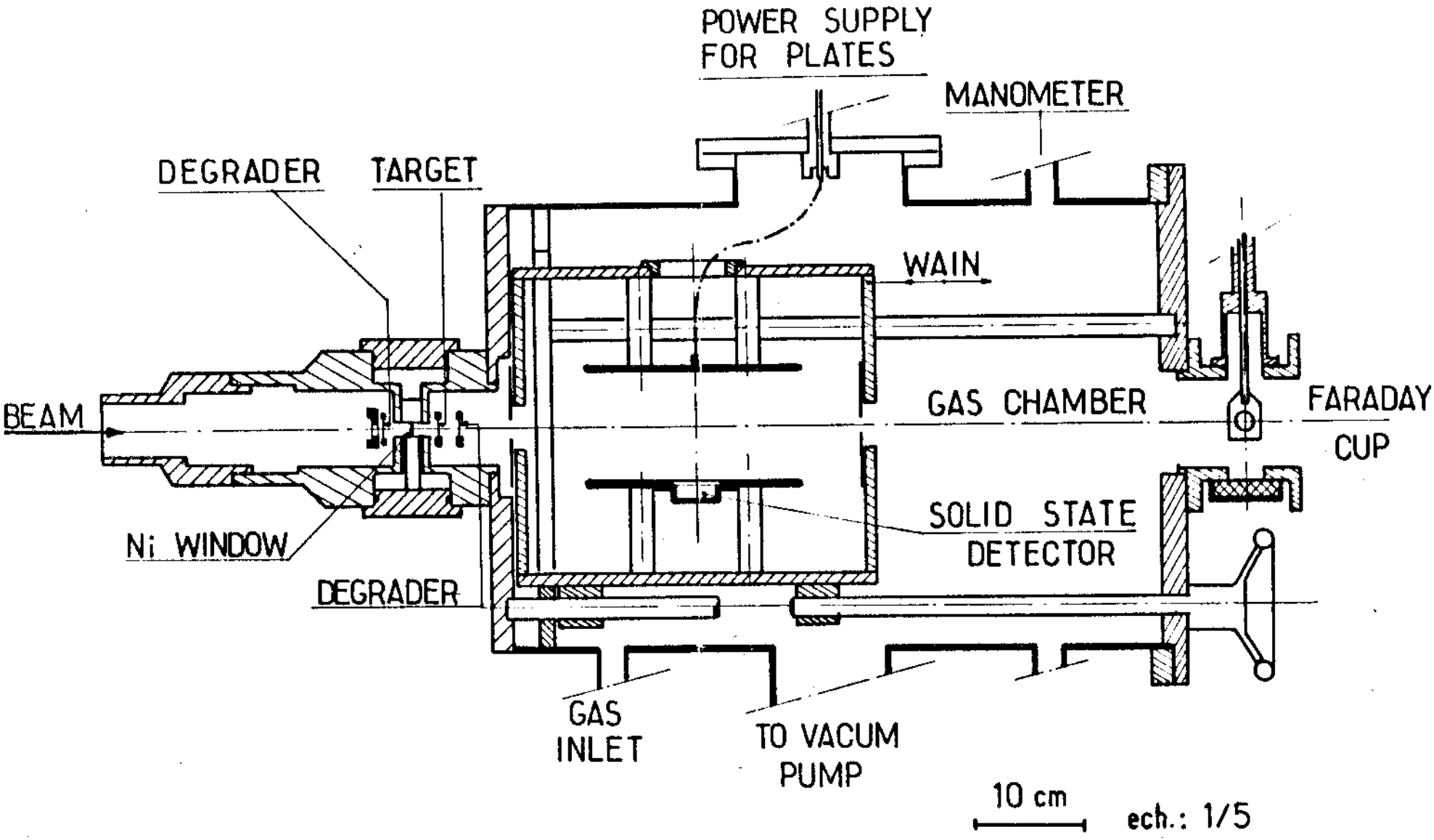
The aim of this experiment is twofold. We desire first to test the possibilities of collection of the heavy recoil nuclei with the device presented schematically on the figure. The recoil nuclei escaping from the irradiated target are first thermalised in a gas (N_2). One then takes advantage of their remaining charge to collect them with an electric field on the surface of a solid state detector. Tests already performed with other beams give absolute efficiency around 5%. The best conditions of collections with very energetic ^{12}C have first to be tested.

We desire secondly to get some insights into nuclear reaction mechanisms induced by 86 MeV/a.m.u. ^{12}C using the possibilities of this recoil chamber. Two kinds of mechanisms should occur in these interactions. If the incident energy is damped (deep inelastic reaction, fusion), the heavy nucleus will be highly excited and the residual nuclei will lie along the $\Gamma_n / \Gamma_p = 1$ line. For heavy nuclei this line is located at about 25 mass units from the stability line. If surface interactions or any reactions leaving the heavy partner at low excitation occur (fireball interaction ?), the residual nuclei will be close to the stability line. Measurements of α emitters produced in interaction with heavy targets seem to be a good test to distinguish between these two kinds of interactions. Some new neutron deficient α emitters should be also found in these reactions.


POWER SUPPLY
FOR PLATES
MANOMETER
DEGRADER
TARGET
WAIN
BEAM
GAS CHAMBER
FARADAY
CUP
SOLID STATE
DETECTOR
Ni WINDOW
DEGRADER
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TO VACUM
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