



A.E. Taylor

Report on research work with the  
cyclotron at Gustaf Werner's  
Institute for Nuclear Chemistry  
in Uppsala

During the past months work on the cyclotron considerable progress has been made in increasing the internal proton beam. The carbon hood has been changed and the filament is now pulsed to run at a higher peak temperature. These changes have resulted in an increase of the internal beam from 0.1  $\mu$  amp to 0.5  $\mu$  amp mean current, and made for less critical positioning of the filament. As a consequence longer runs are now possible.

In about 40 hours operative time on the cyclotron the carbon and hydrogen total cross sections have been determined as  $327^{+3}$  millibarns and  $49^{+1.6}$  millibarns respectively. The errors are standard deviations based on counting statistics and the effective energy is 169 MeV. The deuterium and oxygen cross sections are also being determined at the same energy and preliminary results give values of  $433^{+7}$  millibarns for oxygen and  $72^{+3.5}$  millibarns for deuterium. Further measurements will be made when the rotating condenser bearings have been changed.

The energy spectrum of the internal proton beam has been measured, indicating a half width of 12 Mev for the maximum radius. Tests will be made at a later date to decrease this width and then compare it with the resultant neutron spectrum from a thin Be target.

Part of the electronic apparatus has been moved to the control room where the radiation hazard is small, and during the long counting runs there is now no need for anyone to stay in the underground laboratory.

Uppsala, July 16th, 1953.

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