

THE ACTIVITIES AT THE ZAGREB CYCLOTRON

G. Paić

Institute "Rudjer Bošković", Zagreb

A classical-type cyclotron has been developed during last years to allow for applied activities.

Efforts have been concentrated in two directions:

- i)* Increase of the viability of operation.
- ii)* Development of a research and production programme.

ad i) The following improvement has been achieved:

- 1) The ion-source design has been modified. The filament form has been changed, the gas entrance has been removed from the vicinity of the filament, and the anticathode has been remodeled to allow for maximum lifetime. With these changes, the lifetime of the filament is ≈ 20 hours and that of the graphite chimney is ≈ 100 hours.
- 2) The influence of the introduction of CCl_4 vapours into the accelerating chamber has been tested. Improvements of 20% in beam current have been achieved.
- 3) The quality of the vacuum has been substantially improved by the addition of a refrigerated vapour trap.
- 4) The oscillator operation has been improved by eliminating spurious oscillations.
- 5) An external beam of $0.7 \mu\text{A}$ has been obtained accelerating D^- ions.
- 6) Acceleration of alpha particles: Internal beams of $\approx 20 \mu\text{A}$ have been achieved. The work on increasing the beam intensity is in progress.

ad ii) The programme has been centered around two main points

- 1) Neutron production - where an aluminium target is used to produce neutrons. These neutrons are used to study neutron-induced reactions using nuclear emulsions and to develop techniques for monitoring fast-neutron fluxes by means of small silicon detectors²⁾. Possibilities of using the cyclotron as a facility for the study of biological effects of neutron are investigated.
- 2) Radioisotope production. The interest in the production of

cyclotron radioisotopes, especially for medical purposes, has been increasing for the last few years. Corresponding to that trend, the cyclotron has embarked on a programme to develop the production of ^{67}Ga , ^{123}I , ^{206}Bi , ^{65}Zn and other isotopes, in close collaboration with the Radiochemistry Laboratory of our Institute.

REFERENCES

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- 2) N. Stipčić, I. Šlaus, G. Paić, K. Kovačević and B. Antolković, *International Congress on Cancer*, Florence 1974.

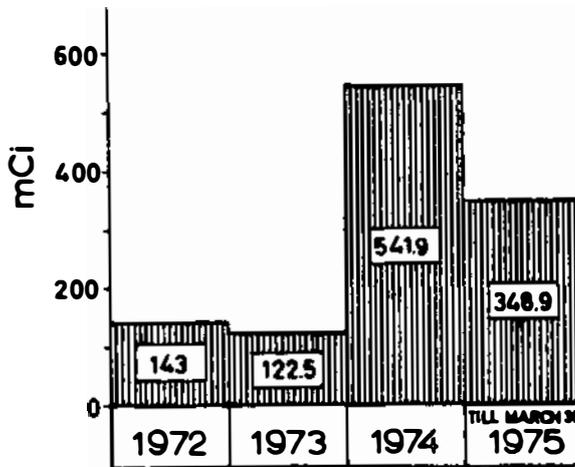


Fig. 1. Shows the quantities of ^{67}Ga delivered to medical users

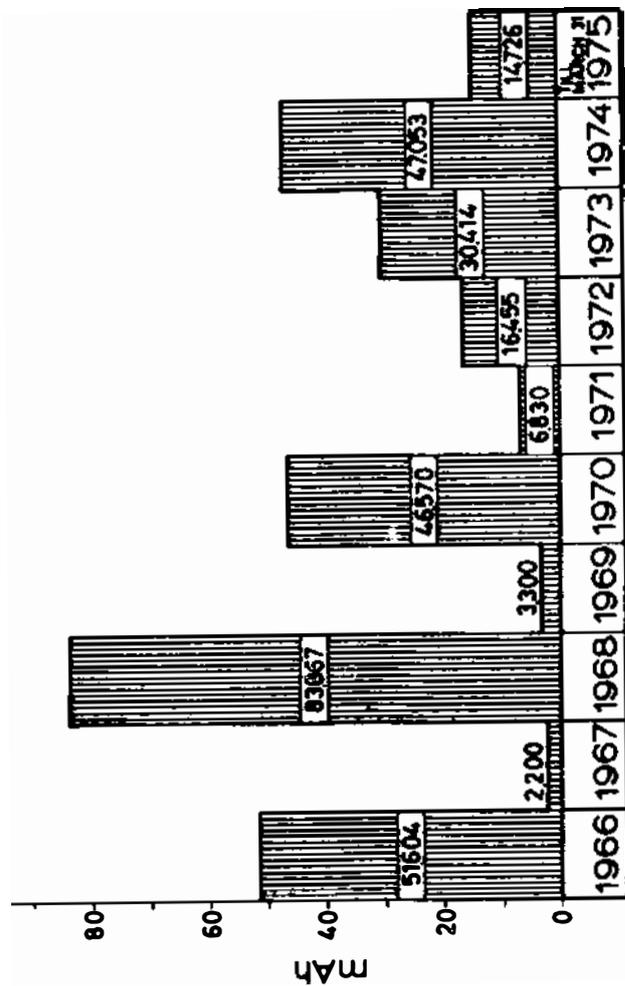


Fig. 2. Shows the number of microamp hours achieved during the last years. The high figures in 1966, and 1968, are due to the extensive production of ^{65}Zn with long irradiation times