PREFACE

This is the first annual report of the Cyclotron and Radioisotope Center (CYRIC) of Tohoku University. We hope this report will introduce CYRIC to the scientific community and give us an opportunity for further communication and collaboration with foreign as well as domestic laboratories.

CYRIC was established in 1977 as an institution for carrying out research studies in various fields by the use of cyclotron and radioisotopes, and also for training researchers of Tohoku University for safe treatment of radioisotopes.

Construction of the cyclotron started in 1974 prior to the establishment of CYRIC. The construction was conducted mainly by nuclear physicists of the Physics Department of Tohoku University. Since CYRIC was established in 1977, the cyclotron has been under the control of CYRIC.

The cyclotron of CYRIC was manufactured by Sumitomo Heavy Industry Inc., Japan from the design of CGR-MeV, France. This type of cyclotron was originally designed and constructed by CGR-MeV for the Service du Cyclotron, CNRS at Orléans, and some improvements on the magnetic-field configuration in the central region and on the RF system have been introduced in our machine. We were successful in extracting a beam from the cyclotron in December 1977. Since then, performance tests of the cyclotron were carried out in parallel with installation and adjustment of the beam transport system, data acquisition system and measuring instruments. The scheduled operation of the cyclotron for research studies started in July 1979. During the first one year of the operation we have experienced unscheduled down time of only 7% of the total beam time. At present we operate the cyclotron four whole days a week for research studies.

In conformity with the aim of establishment of CYRIC, the cyclotron has been used for studies in various fields of research, such as nuclear physics, nuclear chemistry, solid-state physics and element analysis by PIXE and activation, and also for radioisotope production for use in engineering, biology and medicine. Acceleration of heavy ions, such as $^{12}$C, $^{14}$N and $^{16}$O, has been successfully tried. As for main experimental facilities, we have an electromagnetic isotope separator for on-line as well as off-line use, and an apparatus for neutron time-of-flight measurement equipped with a 40-m long flight path. A positron tomograph for nuclear medicine is to be assembled soon.

CYRIC consists of three buildings: the cyclotron building ($5400\ m^2$), the radioisotope building ($2000\ m^2$) and the nuclear-medicine building ($1000\ m^2$). The former two buildings were completed in 1977 and the last one is now under construction.

Since 1978, CYRIC has trained about 400 researchers and graduate students of Tohoku University a year for safe treatment of radioisotopes.

We would like to express our cordial gratitude to the Ministry of Education and the University for the financial as well as moral support given to CYRIC.
during the past years;

December, 1980

Director Susumu Morita