

ETL ION-ACCELERATOR FACILITY

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1. Introduction

Electrotechnical Laboratory (ETL) moved from Tanashi (Tokyo) to Tsukuba Research Center in 1979. At the new establishment, a 4-MV Pelletron and a 300 kV Cockcroft-Walton type accelerator are to be used for neutron-standard developments and for irradiation-effect studies. The 4-MV single-acceleration Pelletron is now in production at the factory of NEC (USA), which is to be installed at ETL by the end of 1981 fiscal year. Installation of the C.W. accelerator, which was transferred from Tanashi location, has been completed with improved performances. An outline of these accelerator facilities together with their applications is the following.

2. Ion Accelerator Specifications

A. Pelletron (NEC 4UH-HC)

Maximum beam energy	4.0 MeV (proton)
Maximum beam current	150 μ A (proton)
Voltage stability	\pm 2 kV
Pulsed proton beam	FWHM 2ns
	Peak current 1mA
Ion source	NEC Duoplasmatron Danfysik Model 910 (improved Nielsen type)

B. Cockcroft-Walton type accelerator

Maximum beam energy	300 keV (proton)
Maximum beam current	1 mA (proton)
Ion source	RF type

3. Applications

A. Neutron Standards

Monoenergetic neutron fluence standards
(International Comparison; 1981 spring~,
144 keV, 565 keV, 2.5 MeV, 5.0 MeV, 14.8 MeV)

B. Radiation Effects

Radiation damage research with dual-beam irradiation
(Fusion materials, Electronic devices)
He gas re-emission (Refractory metals)
Ion-solid interactions (Channeling, Mössbauer, Auger, PIXE)

4. Facility Layout

The layout of the facility is shown in Fig.1.

A. Pelletron Machine Room

1. Pelletron Accelerator
2. Analyzing-Switching Magnet
3. SF₆ gas handling system
4. Cooling water system

B. Cockcroft-Walton Machine Room

C. Ion Experiment Room

5. Four beam transports from Pelletron
6. Two beam transports from C.W.

D. Neutron Experiment Room with an aluminum-grating floor

7. Goniometer for neutron standards

E. Accelerator Controls and Data Processing Room

8. Pelletron and C.W. control consoles
 9. Data processors connected with RIPS* through optical fibers
- *Research Information Processing System

F. Preparation Room

G. Ion Source Test Room

I. SF₆ Storage Tank

