

ENTRY NO. 90

NAME OF MACHINE CP-42 H⁻ Cyclotron
 INSTITUTION THE CYCLOTRON CORPORATION
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 IN CHARGE G.O. Hendry REPORTED BY T.Y.T. Kuo

HISTORY AND STATUS

DESIGN, date .. Mid.. 1977 Model tests
 ENG DESIGN, date .. Mid.. 1977
 CONSTRUCTION, date .. Mid.. 1978
 FIRST BEAM, date (or goal) .. July, 1979
 MAJOR ALTERATIONS

COST, ACCELERATOR
 COST, FACILITY, total
 FUNDED BY

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ENGINEERS
 TECHNICIANS CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or Operators
 OPERATION hr/wk. On target hr/wk
 TIME DISTR, in house %, outside %
 BUDGET, op & dev
 FUNDED BY

RESEARCH STAFF, not included above

USERS, in house outside
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY

MAGNET

POLE FACE, diameter (compact) 120 cm, R-extraction 53 cm
 R injection cm
 GAP, min 5 cm, Field 24 kG }
 max 12 cm, Field 16 kG } at 92,400
 AVERAGE FIELD at R ext 18.4 kG } Ampere turns
 B max / < B > 1.3

NUMBER OF SECTORS { compact 3 } Spiral, max 64 deg
 separated }
 SECTOR ANGLE (SSC) deg

TRIMMING COILS

CONDUCTOR, material and type Hollow Copper
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 100 max kW: current stability 10(-5)
 trimming coils max kW: current stability
 WEIGHT: Fe 35 tons: coils 3 tons
 COOLING system Recirculated Water
 ION ENERGY (Bending limit) E/A = 42 q²/A² MeV/amu
 (Focusing limit) E/A = q/A MeV/amu

ACCELERATION SYSTEM

DEES, number 2 angle 90 deg
 BEAM APERTURE 1.8 cm; DC Bias 1.5 kV
 TUNED by, coarse fine Capacitors, Trimmer
 RF to 26.8 MHz, stable ±
 Orb F to 26.8 MHz
 HARMONICS, RF/Orb F, used 1
 DEE-Gnd, max 35 kV, min gap 0.5 cm
 STABILITY, (pk-pk noise)/(pk RF volt) 10(-4)
 ENERGY GAIN, max 100 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 100 kW
 FREQUENCY MODULATION, rate /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 6x10⁻⁶ H₂ Torr or mbar
 PUMPS, No, Type, Size
 Four 10-inches Diff. Pumps

ION SOURCES

..... PIG

INJECTION SYSTEM**EXTRACTION SYSTEM**

..... Charge Exchange Foil

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m²; movable m²
 TARGET STATIONS in rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
H ⁻	11-42	11-42	200	200 p
SECONDARY				(part/s)

BEAM PROPERTIES

	MEASURED		CONDITIONS	
PULSE WIDTH	40 RF deg	200 pA	42 MeV	H ⁻ ions
PHASE EXC, max	RF deg	pA	MeV	ions
EXTRACT eff	100 %	pA	MeV	ions
RESOL ΔE/E	1 %	pA	MeV	ions
EMITTANCE				
(π mm-mrad)	10 axial	pA	MeV	
	10 rad			

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS (*)
 NEUTRON PRODUCTION (*)
 *Varied

REFERENCES/NOTES

1) G.O. Hendry et.al. Proceedings of 9 th Int.Conf. on
 Cyc. and their April., 125 (1981).

PLAN VIEW OF FACILITY, COMMENTS, ETC.