ENTRY NO: C50
Date: 03 Feb 2005 17:00:55
Machine Name: Oak Ridge Isochronous Cyclotron (ORIC)
Institution: Oak Ridge National Laboratory
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http://www.phy.ornl.gov/hribf/accelerator/oricweb/
Person in Charge of Cyclotron: B. Alan Tatum
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History
Designed by: ORNL
Construction Dates: 1959-1962
First Beam Date: 1963
Characteristic Beams

ions / energy(MeV/N)/current(pps)/power(w)		
proton	52	9.38x10^13
deuteron	25	9.38x10^13
alpha	25	1.56x10^13

Transmission Efficiency (source to extracted beam)
Typical (%): 55
Best (%): 85
Emittance
Emittance Definition:
Vertical (pi mm mrad): 1-2
Horizontal (pi mm mrad): 1-2
Longitudinal (dE/E[%] x RF[deg.]):
USES
Basic Research (%): 70
Development (%): 10
Therapy (%): 0
Isotope Production (%): 0
Other Application (%): 0
Maintenance (%): 10
Beam Tuning (%): 10
Total Time (h/year): 1500

TECHNICAL DATA
(a)Magnet
Type: Conventional Isochronous
Kb (MeV):
Kf (MeV):
Average Field (min./max. T): 1.92
Number of Sectors: 3
Hill Angular Width (deg.):
Spiral (deg.): 30
Pole Diameter (m): 1.93
Injection Radius (m):
Extraction Radius (m): .81
Hill Gap (m): .19
Valley Gap (m): .71
Trim Coils
Number: 10x2
Maximum Current (A-turns): 7200
Harmonic Coils
Number: 4xNsectorsx2
Maximum Current (A-turns):
Main Coils
Number: 1x2
Total Ampere Turns: 1,600,000
Maximum Current (A): 5000
Stored Energy (MJ):
Total Iron Weight (tons): 200
Total Coil Weight (tons): 9
Power
Main Coils (total KW): 1750
Trim Coils (total, maximum, KW): 250
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 6.8-20.1
Harmonic Modes: 1,3
Number of Dees: 1
Number of Cavities: 1
Dee Angular Width (deg.):180
Voltage
At Injection (peak to ground, KV):
At Extraction (peak to ground, KV): 80
Peak (peak to ground, KV): 80
Line Power (max, KW): 200
Phase Stability (deg.): +/-1
Voltage Stability (%): 0.05

(c)Injection
Ion Source: Penning
Source Bias Voltage (kV):
External Injection:
Buncher Type:
Injection Energy (MeV/n):
Component:
Injection Efficiency (%):
Injector: none

(d)Extraction
Elements, Characteristic: Electrostatic Deflector, Coaxial Magnetic Channel, Ironcompensated Lower Magnetic Channel
Typical Efficiency (%): 55
Best Efficiency (%): 85

(e)Vacuum
Pumps: 3 diffusion, 1 cryogenic
Achieved Vacuum (Pa): 2.66x10^-4

REFERENCES

EXPERIMENTAL FACILITIES
Recoil Mass Spectrometer (RMS),
Daresbury Recoil Separator (DRS), Enge Spectrograph, two general purpose end
stations, On-Line Test Facility (OLTF), and High Power Target Laboratory
(HPTL)

COMMENTS