

ENTRY NO: C-4
Machine Name: HIRFL injector cyclotron - SFC
Date: 5/25/01 8:54:34 PM
Institution: Institute of Modern Physics, Chinese Academy of Sciences
Address RD Nanchang 363, Lanzhou 730000, PR China
In Charge of Cyclotron: B.W. Wei
Telephone: +86+931+8274940
Fax: +86+931+8272100
Person Reporting: J.Y. Tang
Web: imp.lzb.ac.cn
E-mail: jiasu@ns.lzb.ac.cn

HISTORY

Designed By: Institute of Modern Physics
Construction Dates: 1984-1987
First Beam Date: 1987

CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
C-12	8.5	0.9×10^{13}	140
Ar-36	6.1	1.7×10^{12}	60
Ca-40	4.75	0.9×10^{12}	26
Kr-84	2.35	0.2×10^{12}	7
Xe-136	1.44	0.1×10^{12}	4

transmission efficiency(source to extract beam)

typical: 10% - **best:** 15%

tranverse emittance

emittance definition: 50%

vertical: 20π mm mrad

horizontal: 20π mm mrad

longitudinal: $1.8(\Delta) E/E$ %xdeg RF

USES

basic research: 42% **therapy:** %
development: 5% **isotope production:** %
other: 18% **maintenance:** 15%
beam tuning: 20% **Total Time:** 6000h/year

TECHNICAL DATA

a)magnet: **type:** compact
Kb: 69MeV/A **Kf:** 30MeV/A
average field (min/max): 1.6 T
number of magnet sectors: 3
hill angular width: hill angular width
spiral (max): 33 deg
pole parameters
diameter: 1.7 m
injection radius: 0.025,0.03 m
extraction radius: 0.75 m
hill gap: 0.19m **valley gap:** 0.33m
trim coils
-number: 11x2
-current(max): 4000 A-turns
harmonic coils
-number: 4xNsectorsx2
-current(max): 600 A-turns
main coils
number: 1x2
total ampere-turns: A-turns
current: 1200 A
stored energy: MJ
weight - iron: 220t **coils:** 16t
power
main coils (total): kW
trim coils (total max): kW
refrigerator (cryogenic): kW
b)RF
acceleration

frequency range: 5.5-16.5MHz
harmonic modes: 1,3
number of dees: 1
number of cavities: 1
dee angular width: 180degrees
voltage
at injection: 70kV(peak to ground, max)
at extraction: 70kV(peak to ground, max)
peak: 70kV(peak to ground, max)
line power(max): 60kW
stability
phase: 0.3 deg
voltage: 0.1%
injection
c)ion source: ECR
external injection: axial
components: Glaser, spiral infl.
source bias voltage: 25kV
injection energy: 0.0015-0.0094MeV/N
buncher: two linear bunchers
injection efficiency: 30%
d)injector:
e)extraction
Two electrostatic deflectors precessional quasi-single turn extraction
efficiency
typical: 50%
best: 85%
f)vacuum
pumps: Two cryogenic pumps
achieved vacuum: 1×10^{-4} Pa
REFERENCES
F.Ye et al., 13th ICCTA, p78
EXPERIMENTAL FACILITIES
T1 station: multi-use station mainly for fast chemical separation. Other stations: see SSC cyclotron
COMMENTS