Entry: **C10** Date: June 4, 1998

Machine Name: SINR Isochronous Cyclotron Institution: Shanghai Institute of Nuclear Research

Address: P.O.Box 800-204 Shanghai 201800 P.R.China
In Charge of the cyclotron: De-ming Li
Tel: (86)(21)59553998-317 Web:
Fax: (86)(21)59553021 E-mail: mbchen@srcap.stc.sh.cn

HISTORY
Design by: in house
Construction time: 1980-1982
First beam: Nov, 1983

CHARACTERISTIC BEAMS
ions / energy (MeV/n) / current (pps) / power (W):
- p, 10-30MeV/n, 30μA, 1kW
- d, 8-10MeV/n, 60μA, 1.2kW
- α, 8-10MeV/N, 15μA, 0.6kW
-

transmission efficiency (total)
- typical: 15% • best: 18%

transverse emittance (rms)
- vertical: π mmmrad
- horizontal: π mmmrad

longitudinal emittance (rms) ΔE/E.deg RF

USES
basic research: 30 % therapy: %
development: % Isotope production: 5 %
other applications: 5 % maintenance: 50 %
beam tuning: 10 %
total time: 1000 h/year

TECHNICAL DATA
a) magnet
type: Sector, H-type
Kb: 30 MeV/A Kf: MeV/A
average field (min-max): 1.46 T
number of magnet sectors: 3
- angle: deg
- spiral (max): deg

pole parameters
- diameter: 1.38 m
- injection radius: m
- extraction radius: 0.61 m

hill gap: 0.146 m valley gap: 0.224 m
field trimming
- trim coils
  - number: 9
  - current (max): 400 A
- harmonic coils
  - number: 3
  - current (max): 120 A
- others
  - number: 3
  - current (max): A

main coils:
- number: 1 pair
- Ampere-turns: T
- current: 450 A

stored energy: MJ
weight: • iron: 120 t • coils: t
power
- main coils (total): kW
- trim coils (total max): kW
- refrigerator (cryogenic): kW

b) RF
- acceleration
  - frequency range: 10 -- 22 Mhz
  - harmonic modes: 1
  - angular aperture: 180 deg
  - voltage: • average (min-max): 70 kV
    • variation with radius:
  - power in (max): 100 kW
  - stability: • phase: 10 deg • voltage: 2 %
- other cavities
  - purpose:
  - frequency range: MHz
  - region of influence: m
  - voltage (max): kV
  - power in (max): kW
  - stability: • phase: deg • voltage: %

c) injection
- internal source: P.I.G.
- external (radial/axial): None
  - elements:
  - source voltage: kV
  - injection energy: MeV/n
  - buncher:
- injection efficiency: %

d) ion sources/injector
PIG source for p,d,α

e) extraction
- elements, characteristics:
  - 30μA for p-ion, ΔE/E ≈ 1%
  -
  -
  -
- efficiency
  - typical: 30 % • best: 35 %

f) vacuum
- pumps: 2 x 1250 l/s oil diff.
- achieved vacuum: 2E-3 Pa

REFERENCES

EXPERIMENTAL FACILITIES

PLAN VIEW OF FACILITY

COMMENTS