

The CC-18\9M CYCLOTRON SYSTEM for PRODUCTION of ISOTOPES for PET

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The CC18/9M Cyclotron System



2013

The CC18/9M Cyclotron System



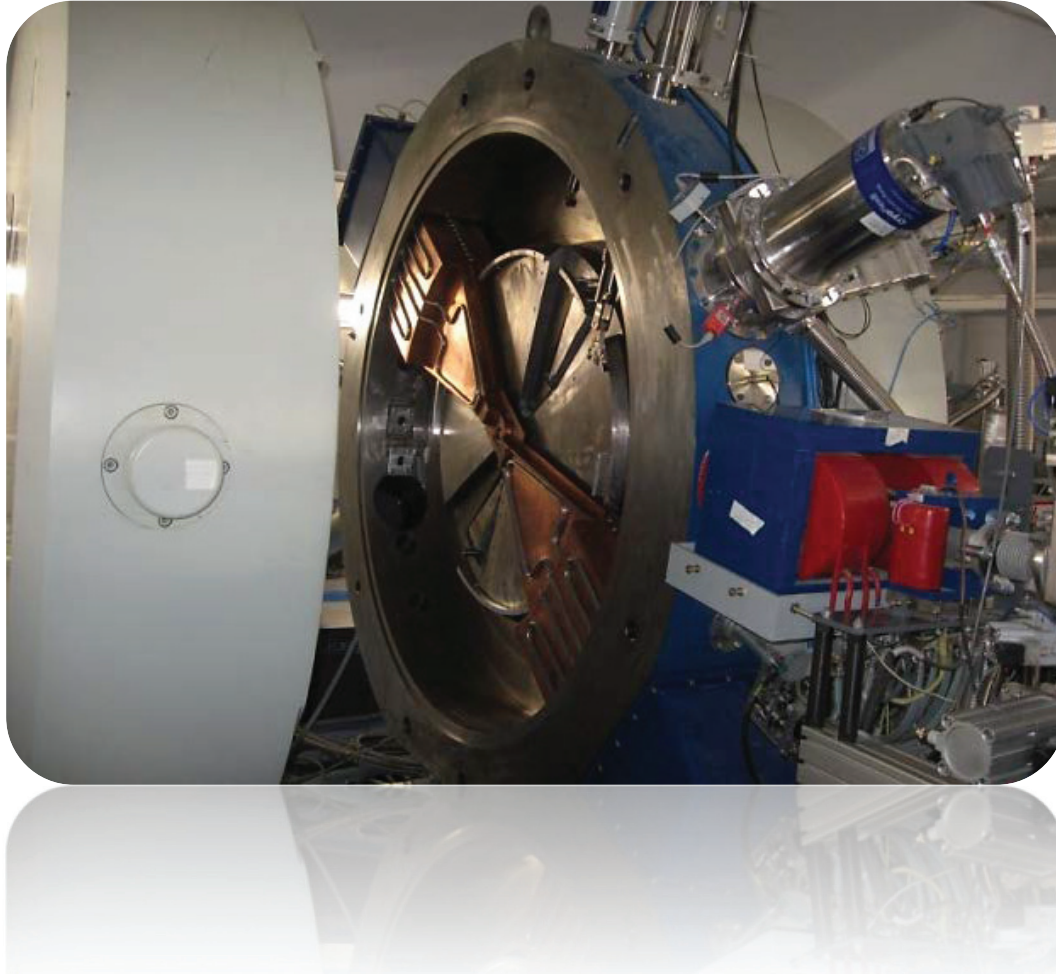
2013

The CC18/9M Cyclotron System



2013

Main Technical Characteristics



- Shielding -type electromagnet
- Energy – 18\9 MeV
- Beam current - 150\50 mA
- RF frequency - 40,68 MHz
- F-18 activity yield - 5 Ci\2h
(one target -50mA current)
- Simultaneous bombardment of two targets
- Vacuum chamber made as a part of the electromagnet
- External injection system

Target System

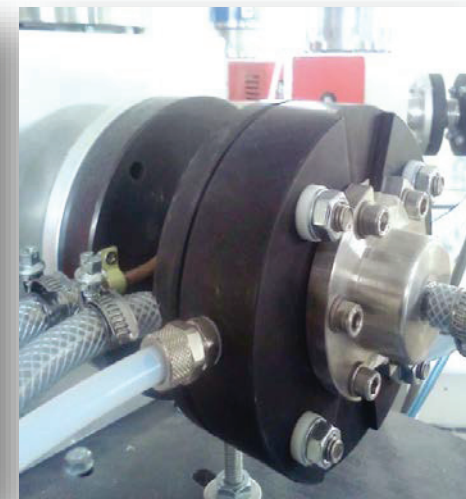
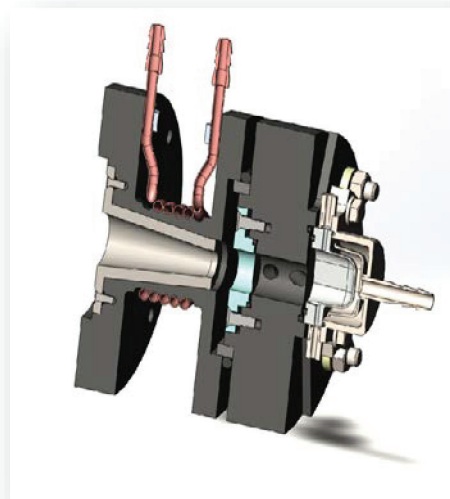


NIIFA

ROSATOM

Water target (F-18)

- Volume - 3 ml
- Activity yield - $0.1 \text{ Ci}/\mu\text{A}\cdot 2\text{h}$
- Routine beam current - 40 mA



Gas target (C-11)

- Under testing



Main Technical Characteristics Compared with Available Analogues

Main Parameters	CC-18/9M JSC “NIIFA“, Russia	Cyclone 18/9 (IBA) Belgium	PET trace (GE) Great Britain	TR-19/9 (ACS) Canada
Type of accelerated particles	H ⁻ /D ⁻	H ⁻ /D ⁻	H ⁻ /D ⁻	H ⁻ /D ⁻
Type of extracted particles	H ⁺ /D ⁺	H ⁺ /D ⁺	H ⁺ /D ⁺	H ⁺ /D ⁺
Beam energy, meV	18/9	18/9	16.5/8.4	19/9
Max beam current, μA, not less than	150/70	150/50	150/60	300/100
Beam energy variation	from 12 up to 18/ from 6 up to 9	No variation	No variation	from 12 up to 19/ from 6 up to 9
Number of simultaneously irradiated targets, not less than	2	2	2	2
Activity yield after 2-hour irradiation (¹⁸ F), mCi/μA	160	150	120	170
Total power consumption, kW, not less than	60	55	70	65



Isotope Technologies Dresden GmbH – Hot Cells



Synthra GmbH - FDG synthesis system



Isomed 2010 - Dose Calibrator



Raytest - Multiply wave detector



Knauer smart line - chromatography



- More than 100 irradiation sessions
- Use of 7500 μAh of the beam time
- Average current - 40 μA
- Average activity after 2h - 4.5 Ci (F-18)
- Average RC yield of FDG - 70%.

Thank your for Attention