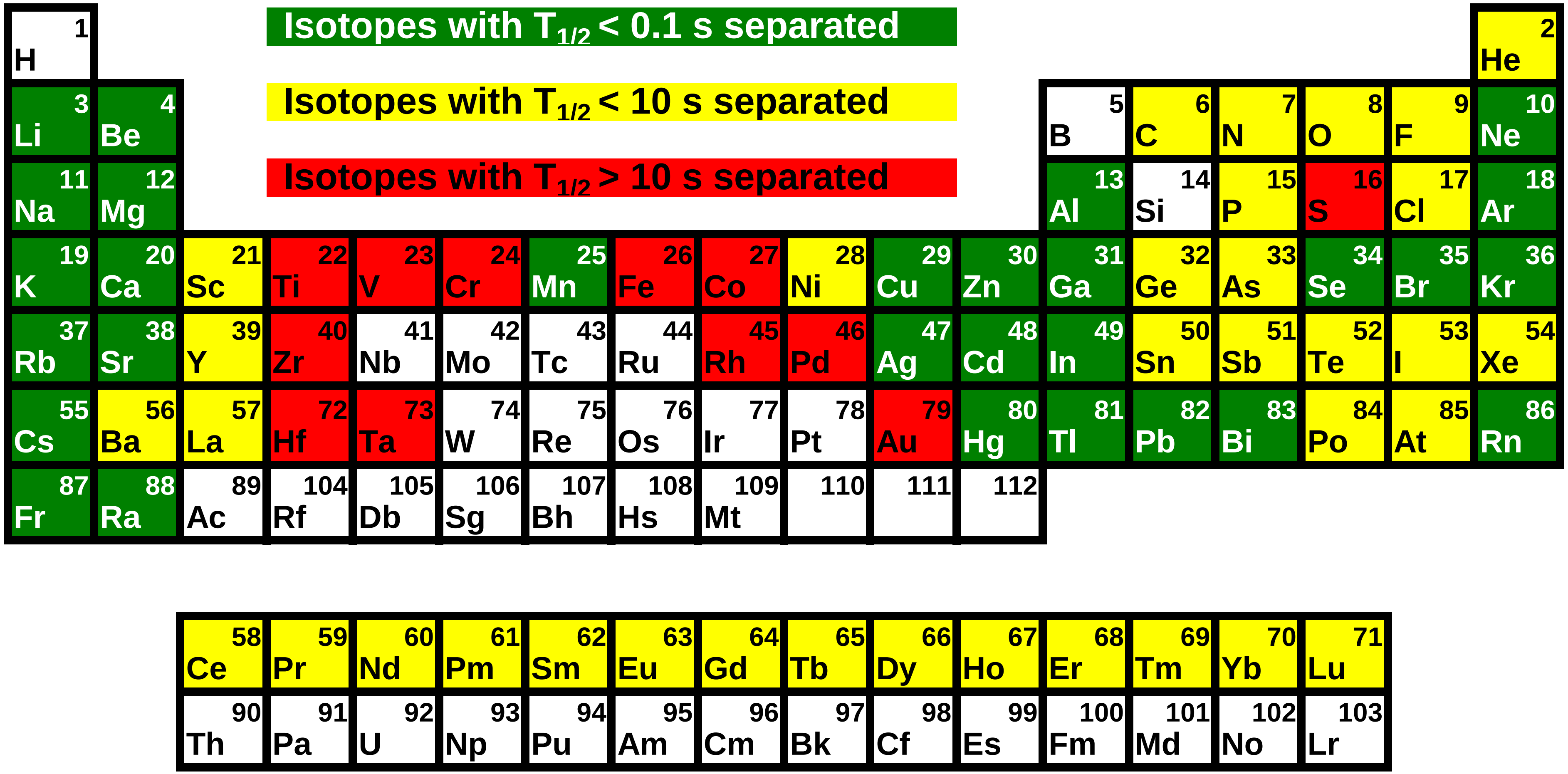
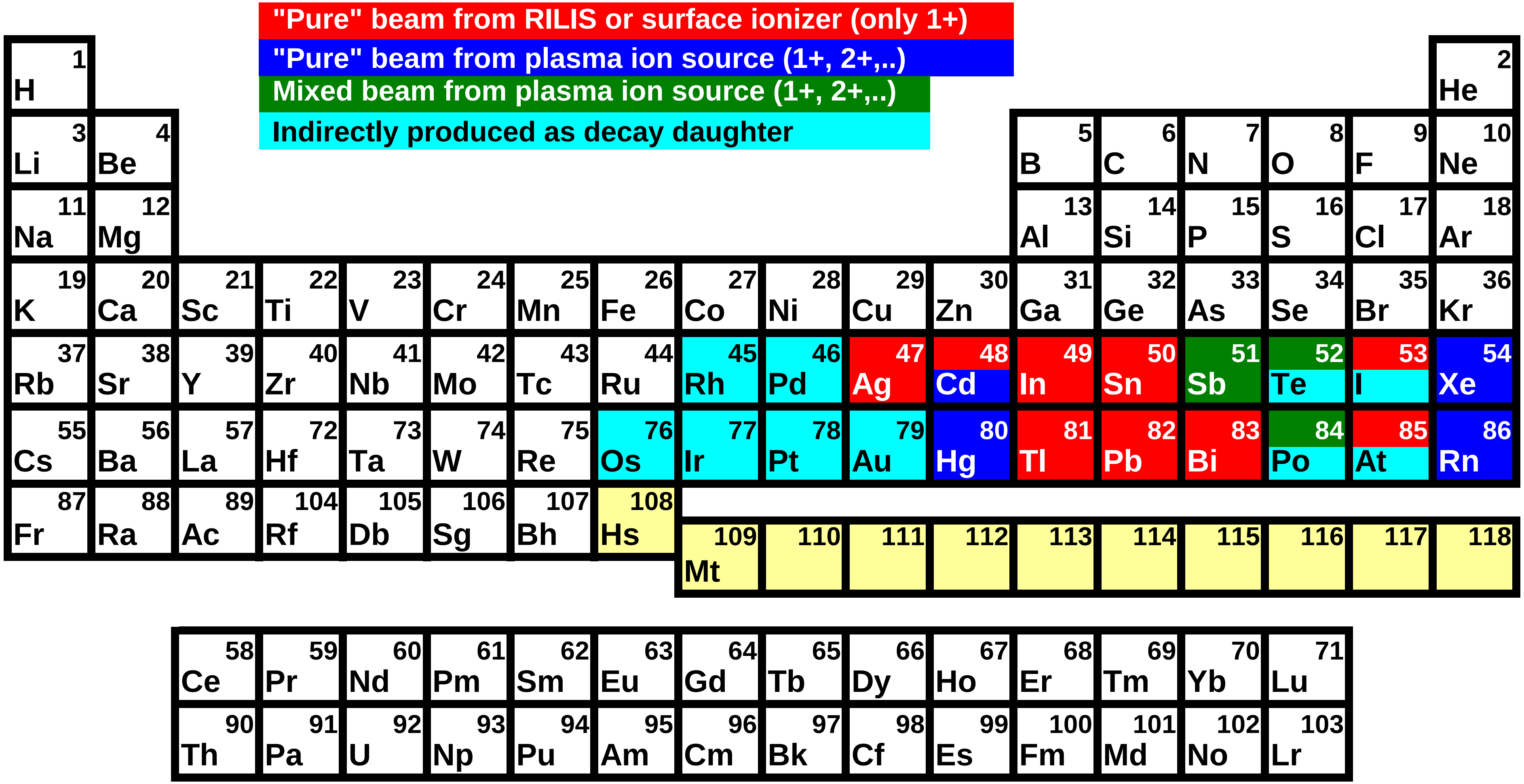
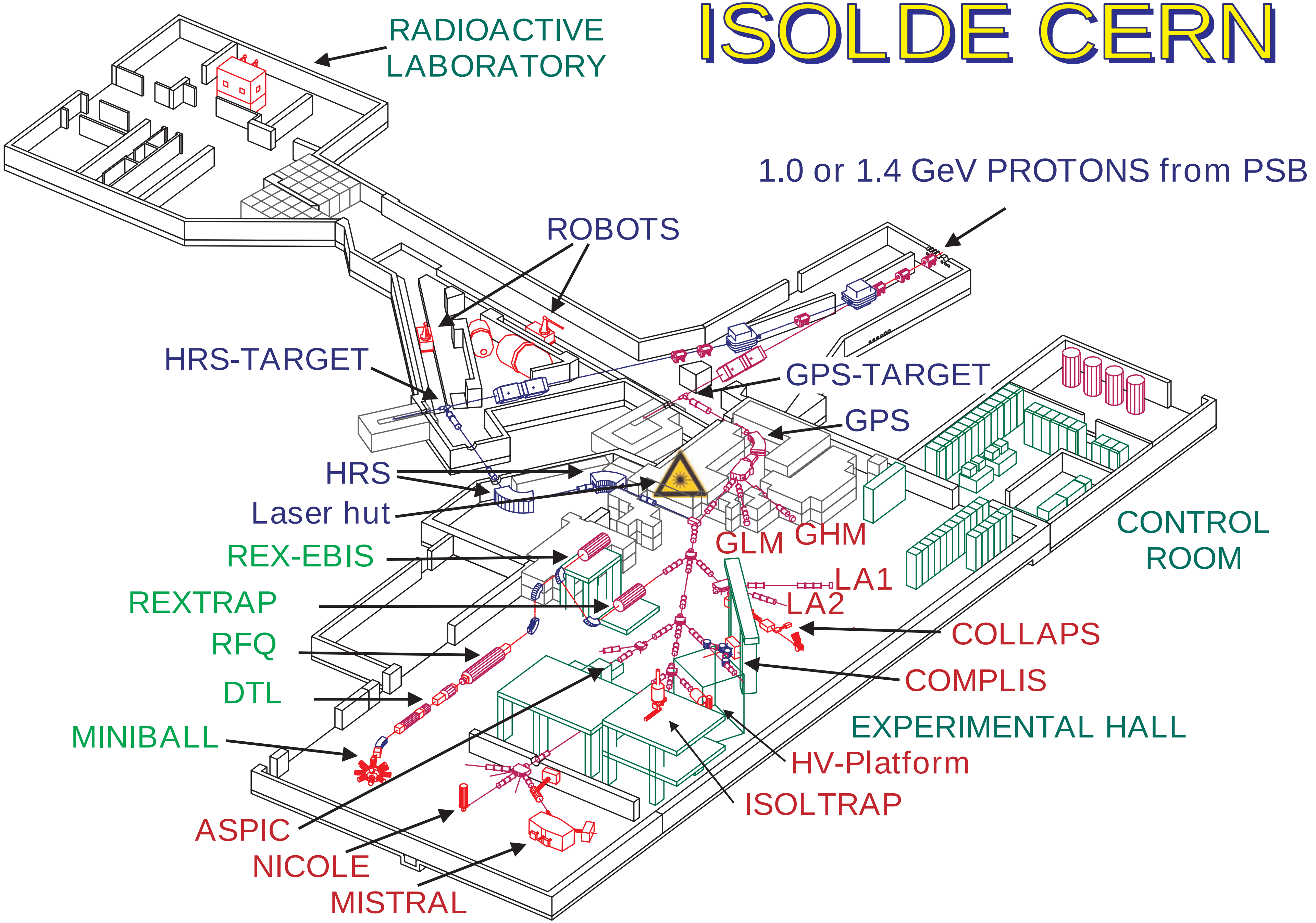
Existing ISOL beams



Group 8-18 element beams available at ISOLDE



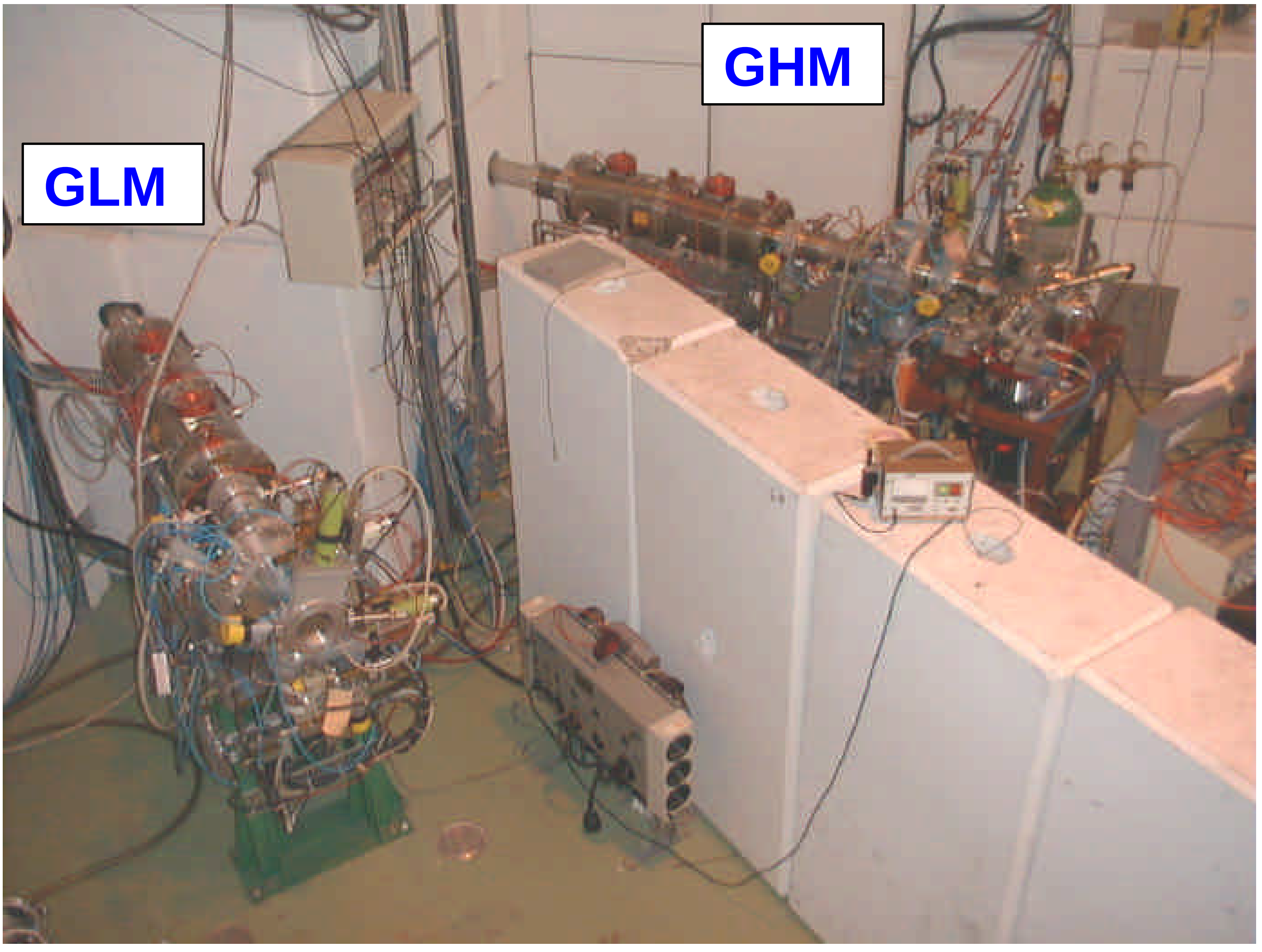
ISOLDE CERN


RADIOACTIVE
LABORATORY
1.0 or 1.4 GeV PROTONS from PSB
ROBOTS
HRS-TARGET
GPS-TARGET
GPS
HRS
Laser hut
GLM
GHM
REX-EBIS
REXTRAP
LA1
LA2
RFQ
COLLAPS
DTL
COMPLIS
MINIBALL
EXPERIMENTAL HALL
HV-Platform
ISOLTRAP
ASPIC
NICOLE
MISTRAL
CONTROL
ROOM

Possible set-ups at ISOLDE

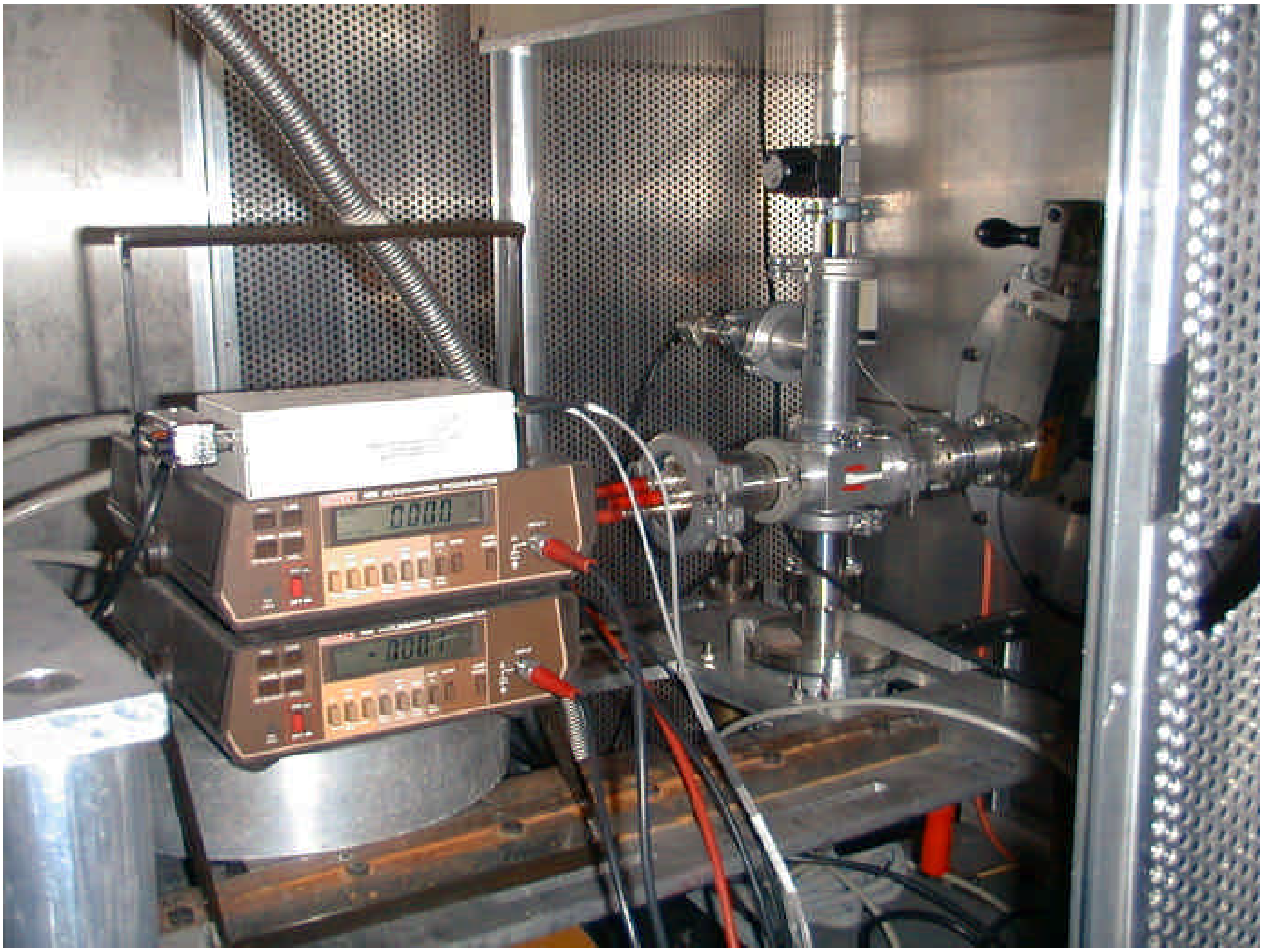
1. at GLM (or GHM)

- **60 q•keV beams**
- **> 2 m • 2 m • 3 m floorspace available**
- **"parasitic" use of Cd, Hg, Tl, Fr, ... beams several times per year**



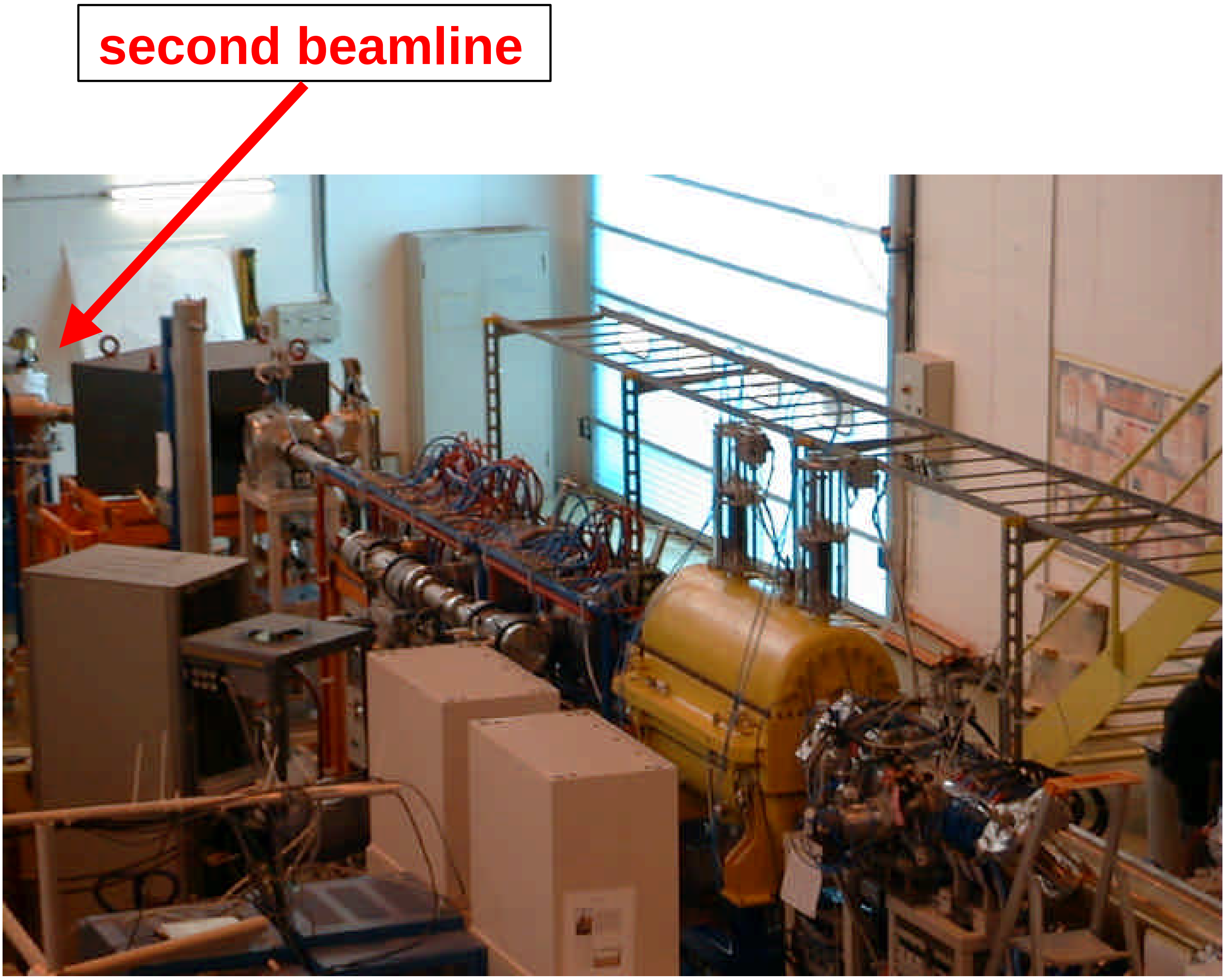
2. on high voltage platform

- up to 260 q•keV beams
- 1.2 m • 0.8 m • 1.4 m space available
- requires central beamline, i.e. no "parasitic" shifts



3. behind REX-ISOLDE

- 300 A•keV with RFQ only
- 1.1-2.2 A•MeV with full LINAC
- up to 3.1 A•MeV with upgrade in 2003
- 2 m • 2 m floorspace available
- requires central beamline plus REX operation
- total REX efficiency >1% (conservative)



Suitable isotopes for on-line chemistry experiments

decay detectable with Si detector
decaying with sufficient B.R. via α or βp
sufficiently "clean" beams to avoid excessive isobaric background (α, β and γ)

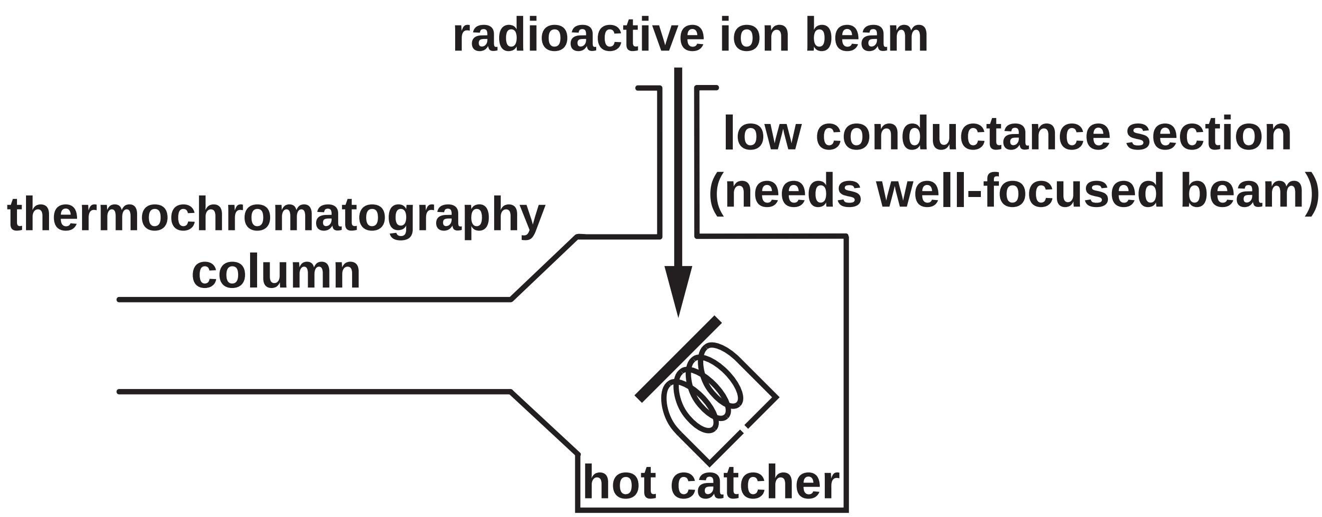
Isotope		$T_{1/2}$	Decay	E(α,βp)	B.R.	Method	< 260 keV		520 keV	REX
		s		(MeV)	%		Ions/s	α or βp per s	2+ ions	
Os	**170**	**7.3**	α	5.40	8.6	MK3: 178Hg>Pt>Os	**9E+1**	**8E+0**	**8E-1**	**9E-1**
Os	**172**	**19.2**	α	5.10	1.1	MK3: 180Hg>Pt>Os	**2E+4**	**2E+2**	**2E+1**	**2E+2**
Ir	**176**	**8**	α	5.12	2.1	MK3: 180Hg>Pt>Ir	**3E+4**	**6E+2**	**6E+1**	**3E+2**
Pt	**176**	**6.33**	α	5.75	38	MK3: 180Hg>Pt	**5E+4**	**2E+4**	**2E+3**	**5E+2**
Pt	**178**	**21.1**	α	5.45	7.7	MK3: 182Hg>Pt	**1E+6**	**9E+4**	**9E+3**	**1E+4**
Au	**179**	**7.1**	α	5.85	22	MK3: 179Hg>Au	**3E+3**	**6E+2**	**6E+1**	**3E+1**
Au	**181**	**14.5**	α	5.48	2.7	MK3: 181Hg>Au	**3E+9**	**7E+7**	**7E+6**	**3E+7**
Hg	**180**	**2.56**	α	6.12	48	MK3	**1E+5**	**5E+4**	**5E+3**	**1E+3**
Hg	**183**	**9.4**	α	5.91	25.5	MK3	**5E+7**	**1E+7**	**1E+6**	**5E+5**
Tl	**181**	**3.4**	α	6.18	20	RILIS	**7E+2**	**1E+2**		**7E+0**
Pb	**186**	**4.82**	α	6.34	35	RILIS	**8E+4**	**3E+4**		**8E+2**
Pb	**188**	**25.5**	α	5.98	8.5	RILIS	**3E+6**	**3E+5**		**3E+4**
Bi	**191g**	**12**	α	6.31	60	RILIS	**6E+4**	**4E+4**		**6E+2**
Bi	**192g**	**34.6**	α	6.06	18	RILIS	**2E+4**	**4E+3**		**2E+2**
Po	**196**	**5.8**	α	6.52	94	MK7: 200Rn>Po	**7E+3**	**6E+3**	**6E+2**	**7E+1**
Po	**198**	**106**	α	6.19	57	MK7: 202Rn>Po	**7E+5**	**4E+5**	**4E+4**	**7E+3**
At	**199**	**7.2**	α	6.64	89	SI: 203Fr>At	**4E+5**	**3E+5**		**4E+3**
At	**201**	**85**	α	6.34	71	SI: 205Fr>At	**4E+7**	**3E+7**		**4E+5**
Rn	**202**	**9.94**	α	6.64	84	MK7	**8E+5**	**7E+5**	**7E+4**	**8E+3**
Rn	**204**	**74**	α	6.42	73	MK7	**3E+7**	**2E+7**	**2E+6**	**3E+5**
Ag	**96**	**6.9**	βp	1.5 - 4.5	18	RILIS	***1E+1***	***2E+0***		***1E-1***
Cd	**99**	**16**	βp	1.5 - 3.5	0.21	RILIS	**1E+3**	**2E+0**	**2E-1**	**1E+1**
In	**100**	**5.9**	βp	1.7 - 4	*5*	RILIS	**2E+1**	**1E+0**		**2E-1**
Sn	**105**	**34**	βp	1.5 - 3	*0.01*	RILIS	**1E+4**	**1E+0**		**1E+2**
Xe	**112**	**2.7**	α	3.22	0.8	MK7	**1E+2**	**8E-1**	**8E-2**	**1E+0**
Xe	**115**	**18**	βp	2 - 4.5	0.34	MK7	**6E+5**	**2E+3**	**2E+2**	**6E+3**

1. coupling to vacuum thermochromatography set-up

a) with tape and differential pumping

(see contribution by Robert Eichler)

b) directly via ion implantation and thermal desorption from heated catcher **(see figure)**



2. coupling to gas chromatography set-up

a) with tape and differential pumping

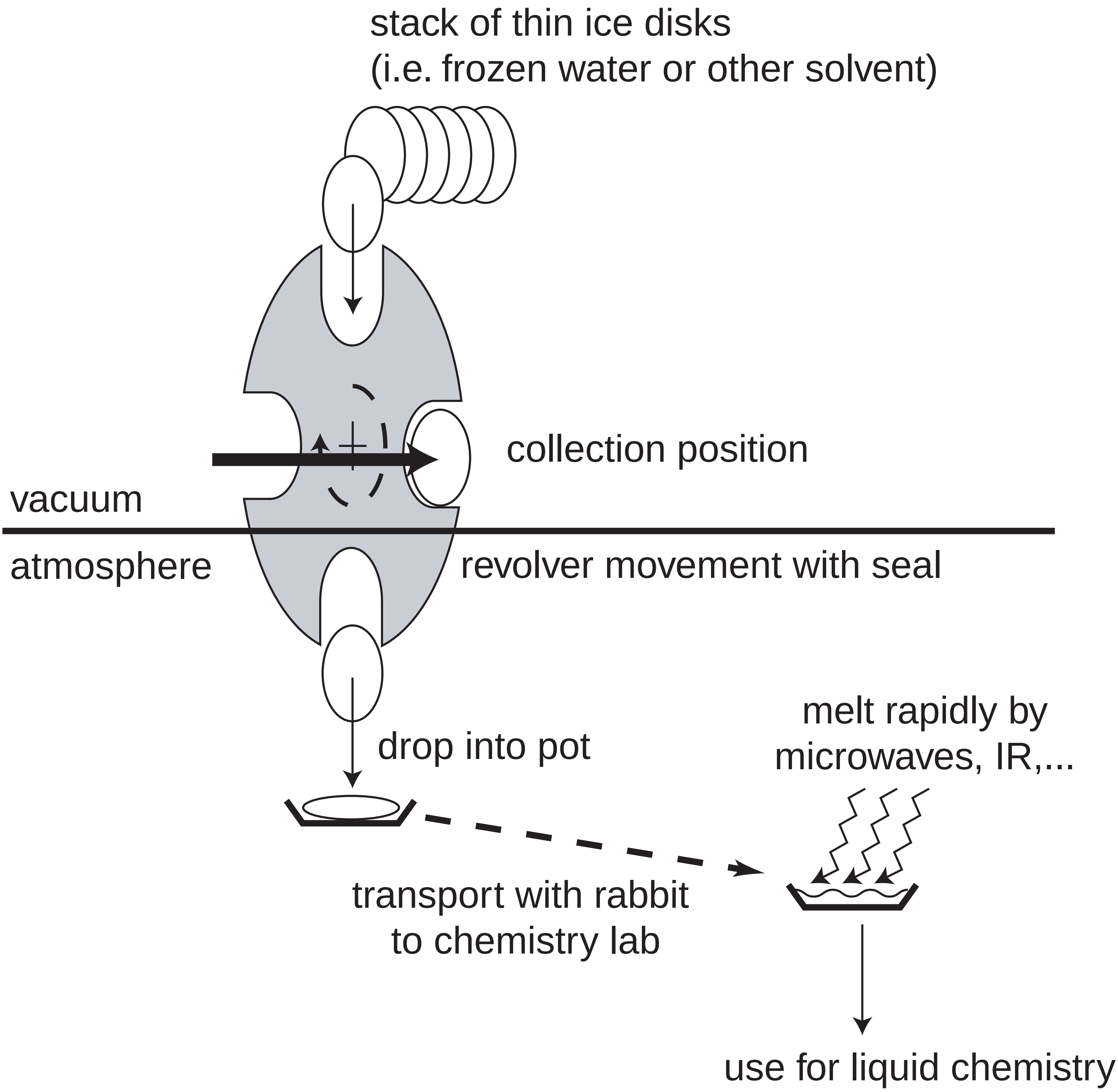
(see contribution by Robert Eichler)

b) implant through window into gas cell

c) implant alpha decay mother into window and use recoils going into the gas cell

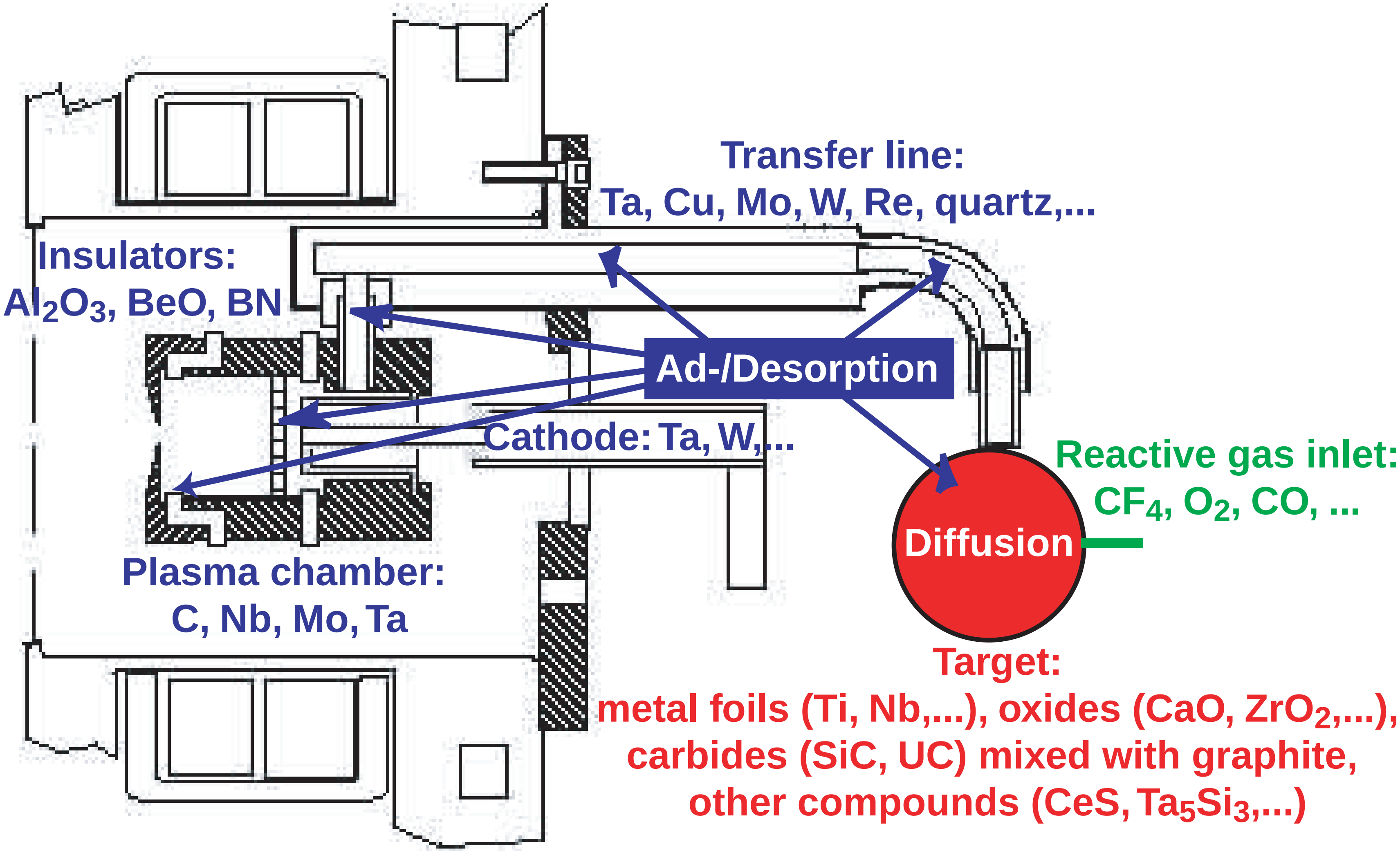
(used at ISOLDE for laser spectroscopy of Bi isotopes, *J. Billowes and P. Campbell, Hyp. Int. 129 (2000) 289***.)**

3. coupling to liquid chemistry set-up



water ice plates on a teflon holder are used as catcher of radioactive ion beams for off-line experiments at ISOLDE:
W. Tröger and T. Butz, Hyp. Int. 129 (2000) 511.

Materials used in ISOL target and ion source units



Positive surface ion source: W, WO_x, Re,...

Cavity of resonance ionization laser ion source and negative surface ion source: TaC, ZrC, CeO_2, LaB_6, Ir_5Ce,...

TARGISOL

Optimized release from ISOL targets

EU-project HPRI-CT-2001-50033

INSTITUTO DE ESTRUCTURA DE LA MATERIA - IEM

Introduction
Participating laboratories and contact persons
Operating and planned ISOL facilities
Conferences and workshops
Literature and useful links
TARGISOL meetings
Workplan

Olof Tengblad

Manoli Turrión

http://www.targisol.csic.es/