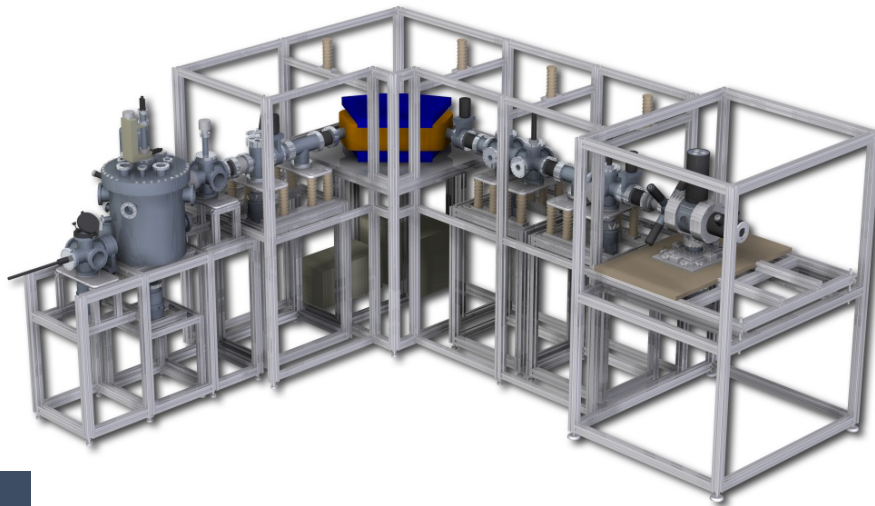


ION IRRADIATION FACILITY-L

- AN ION IRRADIATION FACILITY INCLUDING A HV PLATFORM FOR ION DECELERATION-



IIF-L

The IIF-L is an ion irradiation facility for experiments with various ion types from low-charged ions or molecule fragments up to highly charged ions. It can be equipped with different DREEBIT ion sources such as a Dresden EBIS/T or Dresden ECRIS. Depending on the ion source operation mode, continuous ion beams or ion pulses are transported through the beamline using ion optical elements (Einzel lenses, deflector elements) and ion beam diagnostics (Faraday cups). Ion species separation is realized by a double focusing dipole magnet.

The ion source and the complete beamline are mounted on a high voltage terminal to enable ion deceleration or acceleration towards a grounded target chamber. To focus the ions and transport them into the target chamber without substantial losses a deceleration lens system is mounted at the end of the high voltage tract. The complete ion beamline, the ion source, as well as the target chamber are all designed for ultra high vacuum operation. A command and control system is delivered to operate the IIF-L via computer and automatically analyze the produced spectrum of ions.

EXTRACTED ION OUTPUT

The IIF-L can be equipped with different ion sources. Thus, the available ion intensities depend on the chosen ion source as well as the applied source parameters. In the following table extracted ion beam intensities for the IIF-L including a Dresden EBIS-A are given. The values were recorded before deceleration into the target chamber.

ION SPECIES	IONS / s (DC)	IONS / s (PULSED)
H ⁺	$2 \cdot 10^{10}$	$1 \cdot 10^{10}$
C ⁶⁺		$1 \cdot 10^8$
Ar ⁸⁺	$2 \cdot 10^8$	$1 \cdot 10^8$
Ar ¹⁶⁺		$7 \cdot 10^6$
Ar ¹⁸⁺		$1 \cdot 10^5$
Kr ²⁶⁺	$2 \cdot 10^6$	
Xe ⁴⁴⁺		$6 \cdot 10^4$
Au ⁶⁰⁺		$4 \cdot 10^3$

SCOPE OF DELIVERY

- ion source of the EBIS/T or ECRIS type
- beamline with ion optical elements and Faraday cups for beam transportation
- dipole bending magnet for ion species separation
- ion deceleration lens system
- target chamber
- beamline support rack
- control racks equipped with all power supplies required for the operation of the IIF-L
- remote control system including computer and control software
- high voltage protection shielding for beamline and racks

OPTIONAL EQUIPMENT

- x-ray spectroscopical equipment at the ions source (Be window, x-ray detector, TERX system)
- spare electron gun for EBIS/T ion sources
- additional ion beam diagnostics such as Pepperpot emittance meter or retarding field analyzer
- Metal Ion injection from Volatile Compounds (MIVoC) kit
- metal ion injection kit including pulsed quadrupole beam bender and liquid metal ion source
- target chamber equipment such as sample holders, linear feedthroughs, load lock, etc.
- heating equipment including temperature control for the entire beamline

TECHNICAL PARAMETERS

FACILITY PARAMETERS

source potential	ca. 1 kV up to 20 kV (depending on source type)
deceleration potential	up to 20 kV
ion energy at target chamber	$\sim 100 V \cdot q$ up to $40 kV \cdot q$
ion pulse width	50 ns up to $100 \mu s$ (depending on source type)

GENERAL PARAMETERS

dimensions (length x width x height)	5 m x 4.5 m x 3 m
weight	~ 1000 kg

INFRASTRUCTURAL REQUIREMENTS

cooling water	multiple deionized water circuits, $p \geq 3$ bar each
electrical power consumption	up to 15 kW (depending on source type)

The technical specifications and operation parameters of the IIF-L can be adjusted to customer's demands.

CONTACT

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