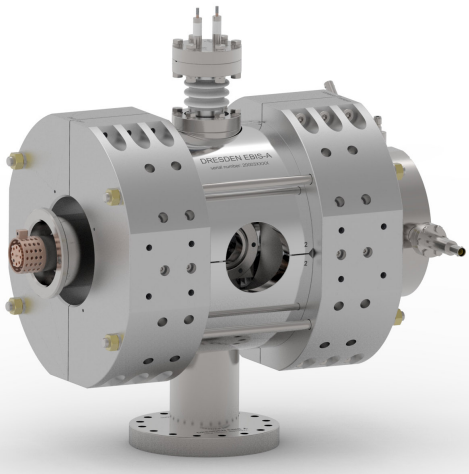
Dresden EBIS-A

- A High Performance Permanent Magnet Electron Beam Ion Source-



Dresden EBIS-A

The Dresden EBIS-A is an electron beam ion source able to produce ions up to the highest charge states of practically all elements of the periodic table. It delivers beams of protons, alpha-particles, various highly charged ion species, as well as molecular fragments.

Overview of Measured Ion Output

Ion Species	Ions / s (DC)	Ions / pulse
H^{+}	$2 \cdot 10^{10}$	$1 \cdot 10^{8}$ at 100 Hz
C^{4+} (helium-like)		$6 \cdot 10^{8}$ at 2 Hz
C^{6+} (fully ionized)		$6 \cdot 10^{7}$ at 2 Hz
Ar^{8+} (neon-like)	$2 \cdot 10^{8}$	$1 \cdot 10^{7}$ at 10 Hz
Ar^{16+} (helium-like)		$7 \cdot 10^{6}$ at 1 Hz
Ar^{18+} (fully ionized)		$1 \cdot 10^{5}$ at 1 Hz
Fe^{24+} (helium-like)		$6 \cdot 10^{5}$ at 0.3 Hz
Fe^{26+} (fully ionized)		$1 \cdot 10^{5}$ at 0.3 Hz
Kr^{26+} (neon-like)	$2 \cdot 10^{6}$	
Xe^{44+} (neon-like)		$3 \cdot 10^{5}$ at 0.2 Hz
Au^{51+} (nickel-like)		$5 \cdot 10^{5}$ at 1.4 Hz
Au^{60+}		$1 \cdot 10^{4}$ at 0.4 Hz

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European Union
Europe funds Saxony.
EFRE
European Regional Development Fund

Scope of Delivery

- EBIS-A incl. all electron and ion optical electrodes, bakeable permanent magnet system and high voltage protection shields readily installed
- power supply units for the operation of the ion source
- control system including computer and software

Optional Equipment

- vacuum system (turbo pump, fine vacuum, vacuum gauge, precision gas inlet valve)
- spare electron gun head (with 0.5 mm / 1.0 mm / 1.5 mm cathode)
- 19"rack for power supplies and measurement equipment
- injection kit for element injection through volatile compounds (MIVoC)
- metal ion injection kit incl. quadrupole beam bender and liquid metal ion source
- x-ray spectroscopic equipment (detector, Be-window, time and energy resolved x-ray detection electronics TERX)
- heating tent incl. temperature control
- small, medium or large ion beamline for ion charge state separation
- ion acceleration / deceleration solutions

Technical Parameters

Dresden EBIS-A Parameters	
max. electron current	200 mA
max. electron energy	20 keV
magnet system	bakeable NdFeB permanent magnets
magnetic induction on axis	600 mT
trap length	60 mm
beam emittance	< 10 mm mrad
ion pulse width	50 ns to 100 µs
ionization factor	$> 1 \cdot 10^{22}\, e/\mathrm{cm}^2$
weight	125 kg (275 lbs) with magnets
dimensions (length x width x height)	ca. 640 mm x 400 mm x 605 mm
cooling water	1.5 l/min at 3 bar
vacuum conditions	UHV ($1 \cdot 10^{-8}$ mbar and better)

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