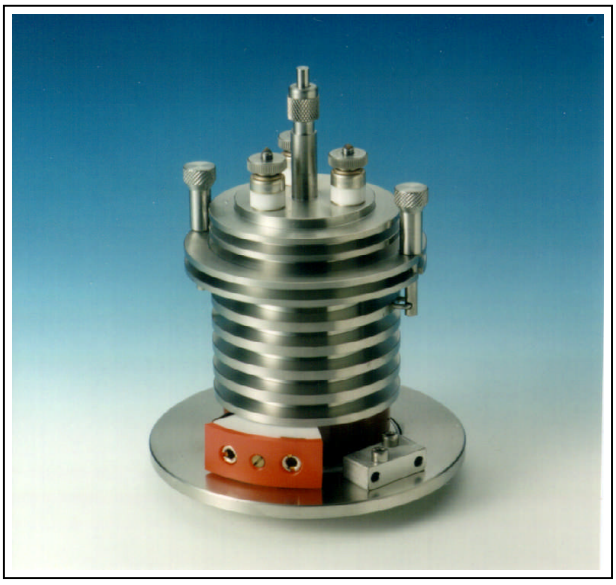
HOLLOW CATHODE ION SOURCE

Model SO-55



Features

- Large variety of ion beams from solid, liquid and gaseous materials
- Beam currents up to 100 µA
- Oven operating temperatures variable up to 1700 ^{o}C
- Easy and quick exchange from one source material to another
- Efficient use of feed materials

General description

The Model SO-55 ion source, a hot filament, hollow cathode ion source, is very versatile and used in a great many research laboratories around the world. The SO-55 ion source is a further development of the 911A ion source.

The SO-55 ion source is able to ionize most materials that have a vapor pressure of 10^{-2} mbar at temperatures of 1700 ^{o}C or lower. This makes the SO-55 is ideally suited for research applications in which a large variety of different ion beams from solid, liquid and gaseous materials is required.

The hollow cathode consists of an outlet gap and a rear gap, both made of tantalum, with the electron emitting filament placed in between. The ions are extracted from the plasma through the outlet gap. The cylindrical anode insulator is made of boron nitride, the anode electrode of tantalum. The oven consists of a boron nitride chamber with a tantalum heating coil around it.
The ion source is supplied with three oven configurations for different temperature ranges: 100 - 500 ^{o}C, 400 - 700 ^{o}C and 600 - 1700 ^{o}C. A separate gas inlet permits the use of a supporting gas with all three oven configurations.

Spare parts to cover the first needs and a set of special tools are included with each Model SO-55 ion source.

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SPECIFICATIONS

. Typical beam currents as measured on the target of a 400 or 500 kV HVEE ion implantation system for energies between 80 - 400/500 keV and with 30 kV extraction voltage

$^{1}H^{+}$	100 µA	$^{74}Ge^{+}$	30 µA
$^{4}He^{+}$	100 µA	$^{75}As^{+}$	50 µA
$^{11}B^{+}$	30 µA	$^{107}Ag^{+}$	50 µA
$^{14}N^{+}$	40 µA	$^{112}Cd^{+}$	40 µA
$^{27}Al^{+}$	60 µA	$^{115}In^{+}$	75 µA
$^{31}P^{+}$	75 µA	$^{120}Sn^{+}$	40 µA
$^{40}Ar^{+}$	100 µA	$^{121}Sb^{+}$	40 µA
$^{64}Zn^{+}$	30 µA	$^{197}Au^{+}$	40 µA

. Beam emittance : < 20 π mm mrad $(MeV)^{½}$

POWER REQUIREMENTS

Filament power supply : 10 V / 30 A, DC
Magnet power supply : 10 V / 30 A, DC
Oven power supply : 10 V / 30 A, DC
Anode power supply : 250 V / 1 A, DC and 100 V / 5 A, DC
Extraction power supply : 20 - 30 kV / 5 mA, DC
Cooling : 200 m^3 air per hour

The SO-55 ion source normally operates at +30 kV with respect to (terminal) ground. Therefore the source must be insulated from (terminal) ground. The source power supplies must be connected to a 30 kV isolation transformer.

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