JONSKI IZVORI

I. HOLLOW ANODE ION-ELECTRON AND PLASMA SOURCES

Ovi izvori se baziraju na novom tipu električnog gasnog pražnjenja u šupljoj anodi Hollow Anode Discharge - HAD /1/. Daljnja R&D ovog pražnjenja su dovela do nove generacije jonsko-elektronskih izvora i izvora plazme. Pokazalo se da su ovi izbori bolji od, na primer, poznatog Kaufmanovog izvora /8 /.

Više podataka o Hollow Anode Discharge u mojim radovima / CV/, i referencama:

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Patenti:

97. V.Miljević, Hollow-Anode Ion-Electron Source, US Pat. No 4, 471, 918 Oct. 3,(1989).

98. V.Miljević, Hollow-anode Optical Radiation source US Pat. No 4, 906,890, Mar. 6, (1990).

104. V. Miljević, Jonsko-elektronski izvor sa šupljom anodom, Jugoslovenski patent broj 46728, 16. jul 1998. godine .

II HOLLOW-CATHODE MAGNETRON ION SOURCE

Magnetronski jonski izvori imaju jedan veliki nedostatak. Spektroskopska mistraživanja su pokazala da je u cilindričnoj magnetronskoj diodi maksimum jonske koncetacije u okolini katode. Medjutim, u postojećim megnetronskim jonskim izvorima jonska struja se dobija kroz otvor u anodi, gde je jonska koncentracija minimalna. Zbog toga magnetronski jonski izvor radi sa velikom strujom pražnjenja u jakom magnetskom polju.

Ovaj problem je rešen pomoću novog tipa magnetronskog pražnjenja /1/ gde se ekstrakcija vrši iz šuplje magnetronske katode gde je jonska koncentracija najveća. Podaci o ovom jonskom izvoru mogu se naći u Handbook of Ion Sorces / 5 /, i u citiranim radovima:

1. V.Miljević, Hollow Cathode Magnetron Discharge, Phys. Lett. 92A (1982) 439-440.

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3. V.Miljević, Hollow Cathode Magnetron Ion Source with Axial Extraction, Rev. Sci.Instrum. 67 (1996) 1224-1226.

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5. .... Handbook of Ion Sources, ...

Handbook of

ION SOURCES

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CRC Press
Boca Raton New York London Tokyo

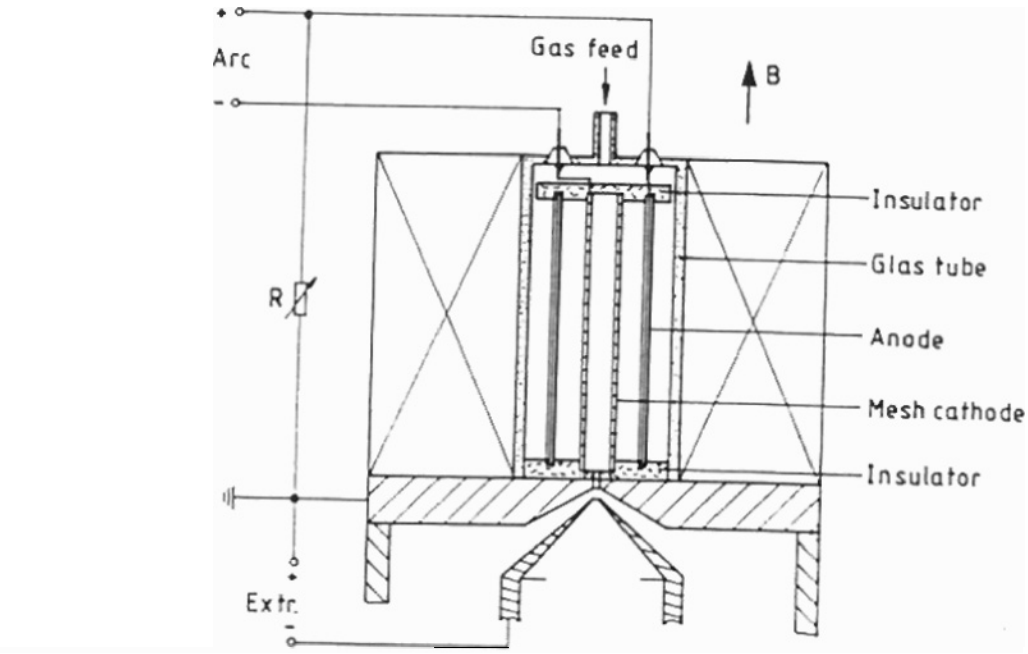

FIGURE 4.5
Hollow-cathode magnetron ion source. (Courtesy of V. Miljević, VIVČA, Belgrade.)

Magnetron ion source with axial extraction.'

4.3.2 *Hollow-Cathode Magnetron (Figure 4.5)*

- Special design and construction details of the source

  The hollow-cathode magnetron consists of a diode with two coaxial cylinders placed in an axial magnetic field. A cylindrical anode is around the cylindrical mesh cathode and leaves a free optical axis through the ion source. Anode (18-mm *O* x 60 mm) and cathode (5.5-mm *O* x 60 mm) are insulated to the base flange with the extraction aperture in its center. The discharge plasma *is* established inside the hollow cathode. When the discharge is established and the base Range connected to the anode, an ion current is obtained even at low accelerating voltages.

- Ion source material and vacuum conditions

  The discharge chamber is a glass tube (30-mm Ø), the anode cylinder Al or stainless steel, the cathode mesh stainless steel *wire* (0.4-mm Ø), eight lines per centimeter, and the insulators are made of lava. The base flange is nonmagnetic.

- Application area of the source

  Accelerators, ion implantation, SIMS, ion beam analysis, optical spectroscopy

- Deliverer or user

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