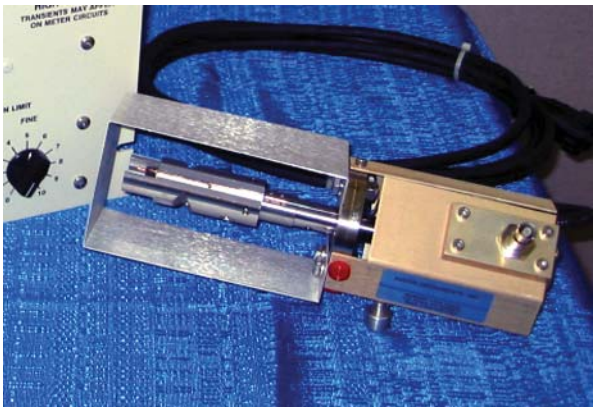


Interchangeable solid anodes

Emission follows anode valence band structure

Accelerated filament electron source

Does not require water cooling or flow of gas

Extremely stable, debris free, electrically quiet

Dual balanced output for calibrations

Available complete with power supply

The Model 642 was originally developed for radiometric calibration of grazing incidence spectrometers. The design features make it useful for many applications. A special feature of this source is that there are two equivalent output beams. These originate from two views of the single emitting spot where the electron beam from the single hairpin filament collides with the interchangeable anode. The emitting spot size depends on exact operating conditions and is typically <0.5mm diameter.

Testing of the source has been done with a 90 degree separation between beams. In this geometry, output is equal to +/-2% at Mg-K, O-K, C-K and B-K. Source output at these points reaches ~10^{11} photons sec^{-1} $sterradian^{-1}$ at less than the maximum 5 Watt anode load.

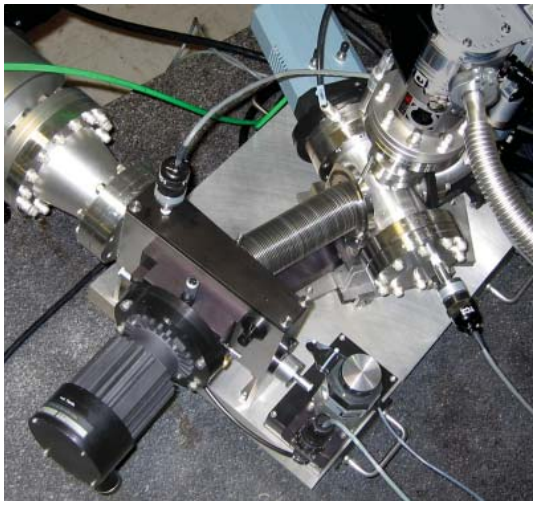
The source mounts on a 2-3/4" all metal seal flange. A 'branch' housing is available for ready access to the two output beams. The source can be baked to 350 degrees C and is provided with spare anodes and filament assemblies. The source controller is also included and provides a cathode heating supply, self-bias control, metering of the heater current and cables. We can also provide a suitable 10 kV power supply (max beam current 1 mA) for a complete, ready to use source system.

Calibration and reflectance work can be performed with the Model 248/310 grazing incidence spectrometer. Built in reverse, the light source is mounted on the scanning carriage. Tune the monochromator to a specific wavelength and a good, fixed trajectory exit beam is emitted for calibration and reflectometry applications. The light sources used with the monochromator need to be compact. Good choices include the Model 642 for EUV and soft x-ray, and the hollow cathode Model 629, for wavelengths ~30nm and longer.

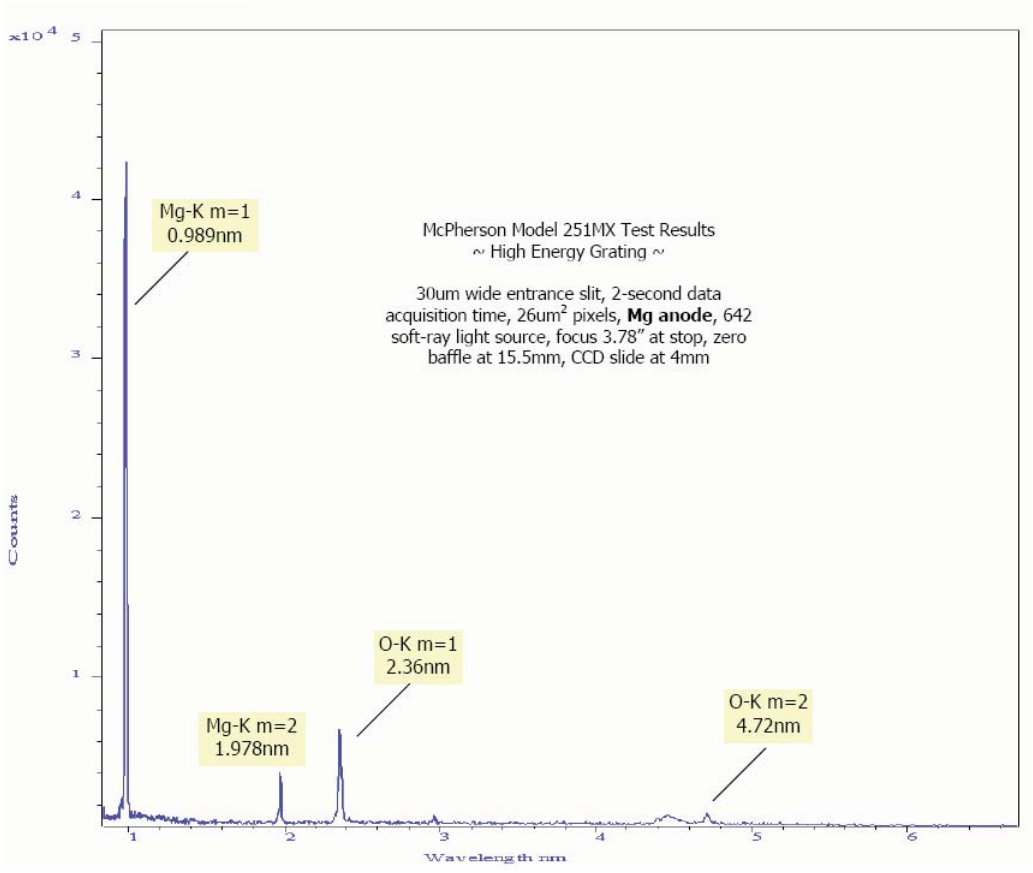
Some examples of available anodes:
many others available, please inquire)

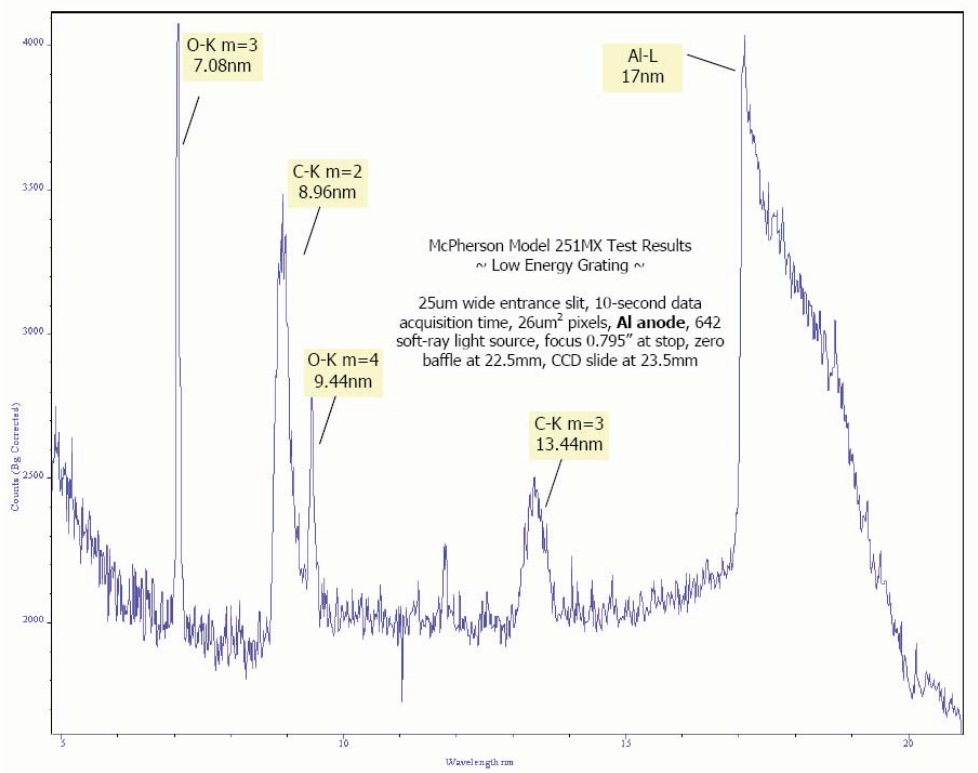
- **Magnesium L/M for 25.1nm (49.3eV**
- **Aluminum L/M for 17.1nm (72.4eV)**
- **Silicon L/M for 13.5nm (91.5eV)**
- **Beryllium K for 11.4nm (108.5)**
- **Boron K for 6.7nm (183.3eV)**
- **Carbon K for 4.4nm (277eV)**
- **Oxygen K for 2.3nm (524eV)**
- **Magnesium K for 0.98nm (1253.6eV)**

1nm or ~1239.7eV is about the limit for the grating based instrument



Model 248/310 grazing incidence spectrometer


x10 4
Counts
Wavelength nm
Mg-K m=1
0.989nm
Mg-K m=2
1.978nm
O-K m=1
2.36nm
O-K m=2
4.72nm
McPherson Model 251MX Test Results
~ High Energy Grating ~
30um wide entrance slit, 2-second data acquisition time, 26um² pixels, Mg anode, 642 soft-ray light source, focus 3.78" at stop, zero baffle at 15.5mm, CCD slide at 4mm


Counts (Bg Corrected)
Wavelength nm
O-K m=3
7.08nm
C-K m=2
8.96nm
O-K m=4
9.44nm
C-K m=3
13.44nm
Al-L
17nm
McPherson Model 251MX Test Results
~ Low Energy Grating ~
25um wide entrance slit, 10-second data acquisition time, 26um² pixels, Al anode, 642 soft-ray light source, focus 0.795" at stop, zero baffle at 22.5mm, CCD slide at 23.5mm