

Soft X-ray Light Source

McPherson 642 soft x-ray electron impact light source may be used for photo physics experiments and element specific extreme ultraviolet (XUV) measurements. It is routinely used for spectrometer calibration and characterization of camera/sensor systems.

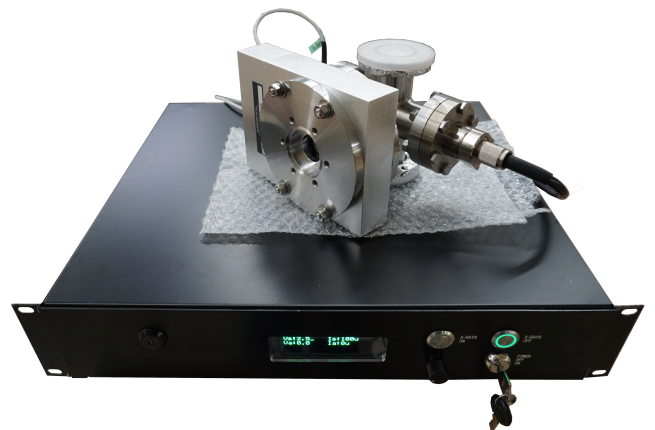
The newly redesigned electron impact soft x-ray source has many features. Two versions are available, single anode and multiple anode, with six (6) anode carousel. In both models, the anodes are easily replaced to change the emission energies at atmosphere. It is available in 1, 10 and 30 watt power ratings. The easy to use controller has e-beam current and high voltage controls. For calibration / process applications, the multiple emission ports may illuminate sample / reference detectors simultaneously.



The new controller is an easy to use high voltage power supply and e-beam emitting filament current controller. It provides integrated and safety interlocked control of the electron impact soft x-ray light source. A dedicated cable connects the controller to the light source's vacuum enclosure.

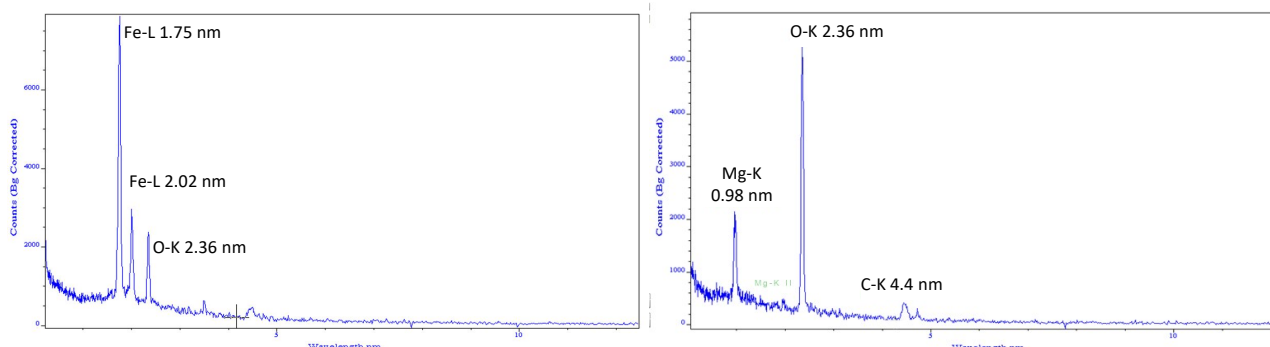
The McPherson 642 is a convenient benchtop source with easily changed anodes. The emitted soft x-ray radiation may be used to photo excite other materials and their surfaces. A pulsed version of the source is contemplated and may open even more application areas.

1, 10 or 30 Watt maximum air/water cooled
Approximately 1 x 4 mm emission
Distance anode to cathode 8-10 mm (nominal)
Readily emits soft x-rays, 70 eV and up
Wide variety of anode materials available
Single interchangeable anode or 6-anode carousel
Avail current ranges: 0-10 ma, 0-1 ma and 0-100 uA
Emission controls include HV and filament current
3-meter high voltage and controls cable
Two output ports (optionally 3 or 4)
Passively air cooled (up to 10 Watts)
100-220 VAC line input



DN40CF flanges * Max bake temperature 100 degrees C * UHV metal-seal version available, inquire

Example emission from Fe, Mg, O



Emission lines collected from the electron impact light source connected via filter wheel with 150 nm thick Al filter, to versatile Rowland circle grazing incidence spectrometer (McPherson 2483/310G) fitted with 2160 g/mm gold coated diffraction grating, and sensitive direct-detection CCD (Andor DO420BN-995)

Characteristic emission lines from electron-impact source

Nanometers	eV	Species	Material	Element Name
25.15	49.3	Mg-L/M	Mg	Magnesium
17.12	72.4	Al-L/M	Al	Aluminum
13.55	91.5	Si-L/M	Si	Silicon
9.34	132.8	Y-Mz	Y	Yttrium
8.20	151.1	Zr-Mz	Zr	Zirconium
7.22	171.7	Nb-Mz	Nb	Niobium
6.76	183.3	B-K	B	Boron
6.44	192.6	Mo-Mz	Mo	Molybdenum
5.23	237	Ru-Mz	Ru	Ruthenium
4.77	260	Rh-Mz	Rh	Rhodium
4.48	277	C-K	Graphite	Carbon
4.36	284.4	Pd-Mz	Pd	Palladium
3.98	311.7	Ag-Mz	Ag	Silver
3.56	348.3	Sc-LI	Sc	Scandium
3.14	395.3	Ti-LI	Ti	Titanium
3.14	395.4	Sc-La	Sc	Scandium
3.12	397	Sn-Mz	Sn	Tin
2.78	446.5	V-LI	V	Vanadium
2.74	452.2	Ti-La	Ti	Titanium
2.48	500.3	Cr-LI	Cr	Chromium
2.42	511.3	V-La	V	Vanadium
2.39	519.2	V-Lb	V	Vanadium
2.36	524.9	O-K	Sapphire	Oxygen
2.23	556.3	Mn-LI	Mn	Manganese
2.16	572.8	Cr-La	Cr	Chromium
2.13	582.8	Cr-Lb	Cr	Chromium
2.02	615.2	Fe-LI	Fe	Iron
1.94	637.4	Mn-La	Mn	Manganese
1.91	648.8	Mn-Lb	Mn	Manganese
1.83	677.8	Co-LI	Co	Cobalt

1.76	705	Fe-La	Fe	Iron
1.73	718.5	Fe-Lb	Fe	Iron
1.67	742.7	Ni-Ll	Ni	Nickel
1.60	776.2	Co-La	Co	Cobalt
1.57	791.4	Co-Lb	Co	Cobalt
1.53	811.1	Cu-Ll	Cu	Copper
1.49	832	Cu-Le	Cu	Copper
1.46	851.5	Ni-La	Ni	Nickel
1.43	868.8	Ni-Lb	Ni	Nickel
1.33	929.7	Cu-La	Cu	Copper
1.31	949.8	Cu-Lb	Cu	Copper
0.99	1253.6	Mg-Ka	Mg	Magnesium
0.95	1302.2	Mg-Kb	Mg	Magnesium
0.90	1380	W-Mz	W	Tungsten
0.83	1486.7	Al-Ka	Al	Aluminum
0.80	1557.5	Al-Kb	Al	Aluminum
0.75	1660.5	Au-Mz	Au	Gold
0.74	1685.4	Y-Ll	Y	Yttrium
0.71	1740	Si-Ka	Si	Silicon
0.70	1774	W-Ma	W	Tungsten
0.69	1792	Zr-Ll	Zr	Zirconium
0.68	1835.9	Si-Kb	Si	Silicon
0.65	1902.2	Nb-Ll	Nb	Niobium
0.64	1922.6	Y-La	Y	Yttrium
0.62	2015.7	Mo-Ll	Mo	Molybdenum
0.61	2042.4	Zr-La	Zr	Zirconium
0.58	2122.9	Au-Ma	Au	Gold
0.57	2165.9	Nb-La	Nb	Niobium
0.55	2253	Ru-Ll	Ru	Ruthenium
0.54	2293.2	Mo-La	Mo	Molybdenum
0.48	2559	Ru-La	Ru	Ruthenium
0.46	2697	Rh-La	Rh	Rhodium
0.44	2839	Pd-La	Pd	Palladium
0.42	2984	Ag-La	Ag	Silver
0.36	3444	Sn-La	Sn	Tin
0.30	4091	Sc-Ka	Sc	Scandium
0.28	4460	Sc-Kb	Sc	Scandium
0.27	4511	Ti-Ka	Ti	Titanium
0.25	4952	V-Ka	V	Vanadium
0.23	5415	Cr-Ka	Cr	Chromium
0.21	5899	Mn-Ka	Mn	Manganese
0.19	6404	Fe-Ka	Fe(a,b)/SS	Iron
0.18	6930	Co-Ka	Co	Cobalt
0.17	7478	Ni-Ka	Ni	Nickel
0.15	8048	Cu-Ka	Cu	Copper
0.15	8398	W-La	W	Tungsten
0.13	9713	Au-La	Au	Gold

All precautions relating to high voltage devices must be respected. However, electron devices operating below 13 kV do not require a special license. As long as no thin windows are present no x-rays below 10 kV can penetrate a vacuum chamber wall.