Hollow Cathode Lamp Manual

1, Operating current: When sufficient energy can be supplied to the host, the minimum operating current is recommend. If self -absorption of the emission is small, the measurement sensitivity is higher and the linear range extended. At the same time, the life of the lamp is prolonged. The energy also depends on the cooperation of monochromator band width (or gap width) and the photomultiplier tube ,which make the sensitivity and stability better.

For the first time use or reuse after long storage time, please use 1 / 3-1 / 2 of the maximum current to stabilize for 30 minutes, and then check the stability and energy. According to the requirements of lamp stability and sensitivity conditions to select the best lamp current. The current of lamp can also be given by the reference manufacturer.

2, Lamp lifetime : equal lamp current (mA) * service time (Hours). Most element lamps lifetime is more than 5000 mA Hours. The reason for the termination of lifetime is that neon consumption lead to could not maintain normal discharge or cathode oxidation, nitriding and melting. The lamp current and light intensity are almost zero.

3, Wavelength: The recommended wavelength is the best sensitive line, which can be selected by users according to their actual situation. The lamp is filled with neon and has a spectrum of neon. Some elements are alloy elements , so have related spectral lines. But there is no interference with the recommended wavelength . There are quartz and glass windows. The quartz window spectral line range is 190-860nm , while glass window is 350-860nm .

4, Lamp stability: The stability of the hollow cathode lamp is related to the elements. Generally, it is required to preheat the lamp for 30 minutes before using. The high melting point metal (such as Cu, Fe, Ni, etc.) element lamp has good stability, short preheat time, less volatile and low melting point (such as Ca, Na, K, Zn, Cd, etc.) element lamp has poor stability. The preheat time is a little longer.

The stability of the mercury lamp is related to the mercury vapor pressure in the mercury lamp due to the mercury element The vapor pressure is related to the temperature, so pay attention to the constant external temperature when using the mercury lamp, reduce the lamp current as much as possible, and the preheating time should be longer.

5, Lamp voltage: Lighting voltage refers to the lowest voltage that hollow cathode lamp can light up. The operating voltage is generally about 60% of the lighting voltage.

Because of the characteristics of steam discharge, mercury lamp has a relatively high lighting voltage (400-600v). When the lamp does not light up, under the state of power on, wipe the surface of the lamp shell with silk or sponge to generate static electricity, and the lighting voltage decreases, and the lamp will light up.

6, Lamp Appearance: The blackening of the wall and electrode is caused by the sputtering of the cathode components. According to the different states of the elements, especially the high vapor pressure lamps of As, Se, Cd, Na, K, Zn and other elements can be seen on the glass shell. This happens in the manufacturing process and has no effect on the performance of the product.

7,Attention in using

a. For Perkin Elmer lamp, which cannot be recognized automatically. You need to select elements manually.
b. The plug of the element lamp has a DC voltage of up to 500V. Pay attention to safety when plugging in and out the element lamp. Do not touch the element lamp socket to prevent electric shock. When the light is on, ultraviolet rays is harmful to eyes and skin ,do not look directly at the light.
c. The lamp contains harmful elements to plants and animals. When hollow cathode lamp is broken. The harmful elements (As, Cd, Pb, Tl) in the cathode of the lamp core are generally about 0.3 g. they should be collected in a special waste tank. Because the mercury content of the mercury lamp is very low, open the ventilation or doors and windows, put the lamp outside for 1-2 days, and then put it in a special waste tank.
d. Do not touch the lamp window with bare hands, because it is dirty, the output strength of the spectral line will be reduced. If there is contamination, use gauze or absorbent cotton to dip alcohol, and wipe the lamp window after wring it dry. Because the volatile steam of organic solvent will absorb the spectral line of As, Se and other elements, it needs to be used after the organic reagent volatilizes
e. When used the maximum current, cathode dissolution occurs due to Joule heat
f. The low melting point element lamp (such as Cs, Rb, K, K-Na, GA, etc.) can be removed after 30 minutes of use, and the window can be placed upward to prevent the cathode material from flowing out of the cathode cup, causing damage to the lamp.
g. It is forbidden to light the mercury lamp in the reverse direction. The mercury lamp can be scrapped if it is lit in the reverse direction.

OPERATION SPECIFICATION (50mm) HOLLOW CATHOD LAMP

Element	Wavelength (nm)	Operating Current (mA)	Max Current (mA)	Window Material	Lifetime (mAH)	Element	Wavelength(nm)	Operating Current (mA)	Max Current (mA)	Window Material	Lifetime (mAH)
Ag	328.1	5	20	quartz	5000	Mo	313.3	15	35	quartz	5000
Al	309.3	15	30	quartz	5000	Na	589.0	5	20	glass	5000
As	193.7	10	20	quartz	3000	Nb	334.4	10	20	quartz	5000
Au	242.8	8	20	quartz	3000	Nd	492.4	10	20	glass	5000
B	249.8	15	40	quartz	3000	Ni	232.0	25	40	quartz	5000
Ba	553.6	10	25	glass	3000	Os	290.9	15	40	quartz	5000
Be	234.9	10	30	quartz	5000	Pb	283.3	8	15	quartz	5000
Bi	306.8	8	20	quartz	3000	Pd	244.8	10	35	quartz	5000
Ca	422.7	10	30	glass	3000	Pr	495.1	10	25	glass	5000
Cd	228.8	8	15	quartz	5000	Pt	265.9	10	20	quartz	5000
Ce	520.0	10	25	glass	5000	Rb	780.0	8	20	glass	3000
Co	240.7	15	40	quartz	5000	Re	346.0	10	25	quartz	5000
Cr	357.9	10	40	glass	5000	Rh	343.5	10	20	quartz	5000
Cs	852.1	8	15	glass	1000	Ru	349.9	10	35	quartz	5000
Cu	324.8	6	25	quartz	5000	Sb	217.6	15	30	quartz	5000
Dy	404.6	15	35	glass	5000	Sc	391.2	20	30	glass	5000
Er	400.8	15	35	glass	5000	Se	196.0	10	25	quartz	3000
Eu	459.4	10	25	glass	5000	Si	251.6	25	45	quartz	5000
Fe	248.3	20	40	quartz	5000	Sm	429.7	15	35	glass	5000
Ga	287.4	12	15	quartz	5000	Sn	286.3	10	20	quartz	5000
Gd	368.4	10	25	glass	5000	Sr	460.7	10	25	glass	5000
Ge	265.2	15	30	quartz	5000	Ta	271.5	15	35	quartz	5000
Hf	307.3	8	20	quartz	5000	Tb	431.9	15	35	glass	5000
Ho	410.4	10	25	glass	5000	Te	214.3	15	30	quartz	5000
Hg	253.7	3	8	quartz	5000	Ti	334.9	15	30	quartz	5000
In	303.9	10	20	quartz	5000	Tl	276.8	10	30	quartz	5000
Ir	264.0	10	25	quartz	5000	Tm	371.8	15	25	glass	5000
K	766.5	6	15	glass	3000	W	255.1	15	40	quartz	5000
La	550.1	10	20	glass	5000	V	318.4	15	35	quartz	5000
Li	670.8	6	15	glass	5000	Y	410.2	15	35	glass	5000
Lu	336.0	10	25	quartz	5000	Yb	398.8	10	20	glass	5000
Mg	285.2	6	30	quartz	5000	Zn	213.9	8	20	quartz	5000
Mn	279.5	15	40	quartz	5000	Zr	360.1	10	35	glass	5000