

Energy Dispersive X-Ray Fluorescence Spectrometer (for all precious metals in gold jewelries) DW-EDX3000



DW-EDX3000 uses X-ray beam from X-ray tube to irradiate the sample, and the element atoms will be excited and emit the secondary X-ray

fluorescence characteristic for its own energy. Then these elements get identified and its content measured. The working principle is as follows:



Specifications

Measurement precision	0.05% (≥96%)							
Analysis range	lppm-99.99%							
Analytical range of elements	More than 60 elements from potassium (K) to uranium (U)							
Measuring object	Powder, solid and liquid							
Measurement time	(60~300)s							
Ambient temperature range	(15-30)t)							
Relative humidity	W70%							
Weight	30kg							
Working voltage	AC 110V/220V							
	Single sample chamber							
	Si PIN semiconductor detector							
Configuration	Amplifier circuit							
	High and low voltage power supplies							

X-ray tube
Non-vacuum chamber

Characteristic X-radiation of element

Each element will emit X-ray at its own energy level when excited. This X-ray is characteristic and called X-ray fluorescence.

It is the foundation of analysis.

Scattering

It is the background of spectrum.





Photoelement

The photoelectron is the foundation of detector. In the sample, the X-ray intensity of every element is expressed as 11,12,13,14,15.....respectively.

The clement content C is the function of X-ray fluorescence intensity I, expressed as follows:

 $C \equiv f$ (11,12+13+14+15....)

This equation is too complicated and can be simplified as:

 $C = K111 + KI2 + KI3 + K4I4 + K5I5 \dots$

Where

C is the element content in the sample; 11,12,13,14,15.....arc X-ray intensity of element respectively; K1,K2, K3.K4,K5 are coefficients

which can be determined by measuring known standard sample to calibrate.



Element

Content(%)

Element

Contenl(%)

Cr	0.001	Fe	0.001
Ru	2.011	Ni	0.218
Rh	13.25	Со	0.011
Pd	10.125	Cu	0.207
Ag	0.781	Zn	0.221
Ir	3.104	Au	2.302
Pt	77.816	In	2.011

Pa	IA	PERIODIC TABLE OF EIEMENTS											0					
1	1 H 1.008				(Cha	aract	erist	ic X-	Ray	ener	·gy	able)				2 He 4.008
H		IIA											IIIA	IVA	VA	VIA	VIIA	
2	3 Li 6.94 0.052	4 Bc 9.012 0.110	1										5 B 10 Ā I 0 1 8 5	6 C 12.01 0.282	7 N 14.01 0.392	8 O 15.99 0.523	9 F 18.990. 677	10Ne 20.17 0.861
3	11Na 22.99 1.041	12Mg 24.31 1.254						1995	and the second				13 Al 26.99 1.487	14 Si 28.09 1.740	15 P 30.97 2.015	1fi S 32.06 2,307	17Cl 35.45 2.622	18 Ar 39.94 2.957
L		11201	III B	rv b	VB	VI B	VII B		VIII		ΙB	ΠВ		1.838	2.142	2.468	2.817	3.191
4	19 K 39.1 3.312 3.589	20 Ca 40.08 3.690 4.012 0.341 0.344	21 Sc 44.96 4.088 4.459 0.395 0.399	22 Ti 47.90 4.508 4.931 0.452 0.458	23 V 60.94 4.949 5.427 0.51 0.519	24 Cr 51.99 5.411 5.947 0.571 0.581	25Mn 54.94 5.895 6.492 0.636 0.647	26 Fe 55.84 6.400 7.059 0.704 0.717	27 C« 58.93 6.925 7.649 0.775 0.790	28 Ni 58.7 7.472 8.265 0.849 0.866	29 Cu 63.54 8.041 8.907 0.928 0.948	30 Zn 65.38 8.631 9.572 1.009 1.032	31 Ga 69.72 9.243 10.26 1.096 1.122	32 Ge 72.5 9.876 10.98 1.186 1.216	33 As 74 92 10 53 11 73 1.282 1.317	34.Se 78.9 11.21 12.50 1.370 1.419	35Br 79.90 11.91 13.29 1.48 1.526	36 Kr 83.8 12.63 14.12 1.587 1.638
5	37 Rb 85,47 13,38 14,97 1,694 1,752	38 Sr 87.82 14.14 15.85 1.806 1.872	39 Y 88.91 14.93 16.75 1.922 1.996	40 Zr 91.22 15.75 17.69 2.042 2.124 2.302 1.792	41 Nb 92.91 16.58 18.65 2.166 2.257 2.462 1.902	42 Mo 95.94 17.44 19.63 2.293 2.395 2.623 2.015	43 Tc #(999) 18.33 20.65 2.424 2.538 2.792 2.122	44 Ku 101.0 19.24 21.69 2.558 2.683 2.964 2.252	45 Rh 102.9 20.17 22.76 2.696 2.834 3.144 2.376	46 Pd 106.4 21.12 23.86 2.838 2.990 3.328 2.503	47 Ag 107.9 22.10 24.99 2.984 3.151 3.519 2.633	48 Cd 112.4 23.11 26.14 3.133 3.316 3.716 2.767	49 In 114.8 24.14 27.38 3.287 3.487 3.92 2.904	50 Sn 118.6 25.19 28.60 3.444 3.662 4.131 3.044	51 Sb 121.7 26.27 29.85 3.605 3.843 4.347 3.188	52 Te 127.6 27.38 31.13 3.769 4.029 4.570 3.335	53 I 126.9 28.51 32.44 3.937 4.220 4.800 3.484	54 Xe 131.3 29.67 33.78 4.111 4.422 5.036 3.636
6	55 Cs 137.3 30,85 35,15 4,286 4,620 5,280 3,794	56 Ba 137.3 32.07 36.55 4.467 4.828 5.531 3.953	Ln	72 Hf 178.4 55.38 63.56 7.898 9.021 10.51 6.958	73 Ta 180.9 57.11 65.56 8.145 9.341 10.81 7.172	74 W 183.8 58.86 67.59 8.396 9.670 11.28 7.386	75 Re 186.2 60.66 69.66 8.651 10.01 11.68 7.602	76 Os 190.2 62.48 71.78 8.910 10.35 12.09 7.821	77 Ir 192.2 64.35 73.93 9.173 10.71 12.51 8.040	78 Pt 195.0 66.25 76.13 9.441 11.07 12.94 8.267	79 Au 197.0 68.19 78.37 9.711 11.44 13.38 8.493	80 Hg 200.5 70.16 80.66 9.987 11.82 13.82 8.720	81 Ti 204.3 72.18 82.99 10.27 12.21 14.28 8.952	82 Pb 207.2 74.23 85.36 10.55 12.61 14,76 9.183	83 Bi 208.9 76.32 87.77 10.84 13.02 15.24 V.41V	84 Po #(209) 78.46 90.24 11.13 13.44 15.74 9.662	85 A1 >(210) 80.64 92.75 11.42 13.87 16.25	86 Rn #(222) 82.86 95.32 11.72 14.32 16.77
7	87 Fr (223) 82.12 97.93 12.03 14.77	88 Ra # 226.0 87.44 100.6 12.34 15.23 17.8 10.60	An	 Alkali Metals Halogen Alkaline earth Mark 1: #Radioactive Elen 2: All the Numbers a Element Symbol. Atomic 						lon-Me anthan are gas dered Weigh	tal toids es t, K	Trans Trans Acti Main Man N one in a, Kβ	itional on ides group for this way, L a , L	element metal lement ay, Ato β,Lγ	s mic Nu ,Lc	amber		

Ln	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69Tm	70Yb	71 Lu
	138.9	140.1	140.9	144.2	#(147)	150.4	152.0	157.2	158.9	162.5	164.9	167.2	168.9	173.0	175.0
	33.30	34.57	35.86	37.19	38.54	39.91	41.32	42.76	44.23	45.73	47.26	48.82	50.41	52.04	53.59
	37.99	39.45	40.95	42.48	44.05	45.65	47.28	48.95	50.65	52.38	54.16	55.96	57.81	59.69	61.61
	4.651	4.840	5.034	5.230	5.431	5.636	5.846	6.059	6.275	6.495	6.720	6.948	7.181	7.414	7.654
	5.043	5.262	5.489	5.722	5.956	6.206	6.456	6.714	6.979	7.249	7.528	7.810	8.103	8.401	8.708
	5.789	6.052	6.322	6.602	6.891	7.180	7.478	7.778	8.104	8.418	8.748	9.089	9.424	9.779	10.14
	4.124	4.287	4.452	4.632	4.816	4.994	5.176	5.361	5.546	5.742	5.942	6.152	6.341	6.544	6.752
An	*** (227) (227) (227) (0) (0) (1) (2) (0) (1) (2) (0) (1) (2) (0) (1) (2) (1)	90 Th # (232) »)2,19 106,1 12,97 16,2 18,98 18,98 11,12	91 Pa # 231.0 94.64 108.9 13.29 16.7 19.55 19.55	92 U # 238.0 97.14 111.8 13.61 17.22 20.16 11.62	93 Np (237) (237) (237) (1237)	94 Pu # (244) 102.3 117.7 14.28 18.28 18.28 21.40 12.12	95Am #* (243) 104.9 120.8 14.62 18.83 22.04 12.38	96Cm #* (247) 107.7 123.9 14.96 19.39 22.69	97 Bk #* (247) 110.5 127.1 15.31 19.97 23.37	98 Cf # * (251) 113.3 130.4 15.66 20.56 24.06	99 Es #* (252) 116.2 133.7 16.02 21.17 24.76	100Fm #* (257) 119.2 137.2 16.38 21.79 25.47			

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