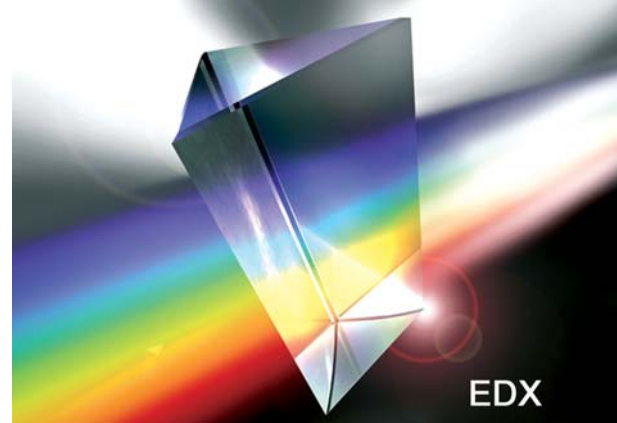


Application Note

EDXRF Analysis of Orchard Leaves



Description

Orchid leaves are used to determine the accuracy of XRF instruments in evaluating trace elements. The orchard leaf, is particularly useful, in extracting a range of elements in the ppm level from the surrounding soil. The orchard leaves used here come from NIST Certified Reference Materials (NIST-SRM Program), and are verified by various methods, including wet chemistry.

Application Data

A number of XRF spectrums are obtained from NIST-SRM-1751, certified Orchard Leaves from the National Institute of Science and Technology. The results are shown below. In addition, using "Peak Fitting" methods, the sample is analyzed for elemental concentrations along with Fundamental Parameters. The result, an accurate quantitative analysis of all inorganic elements present in the leaves.

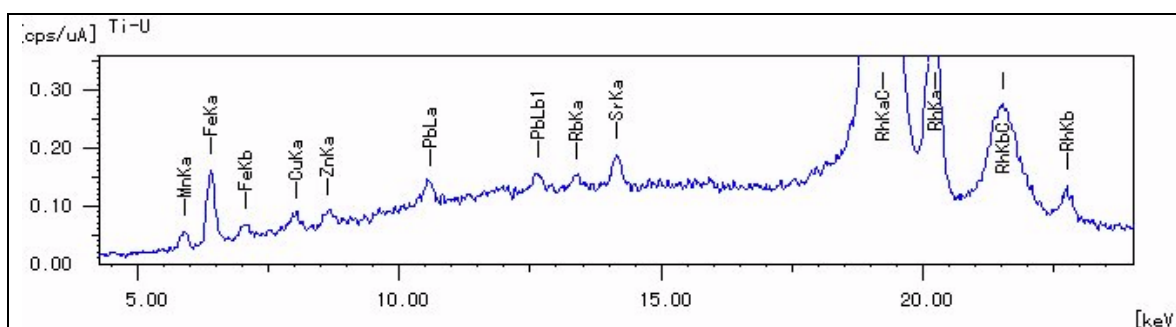


Fig. 1. Spectrum of Orchard Leaves (Mn $K\alpha$ to Rh $K\beta$: 5 keV to 24 keV)

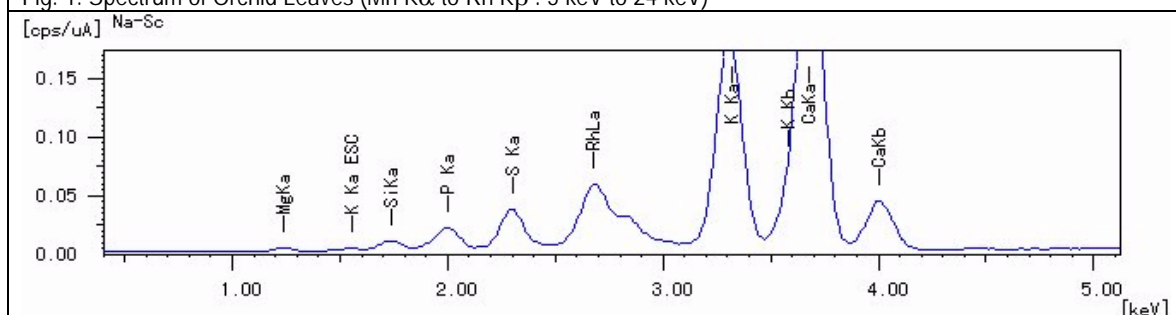


Fig. 2. Spectrum of Orchard Leaves (Mg $K\alpha$ to Ca $K\beta$: 0.50 keV to 5 keV). Notice the ability of the peak fitting software to resolve the K $K\beta$ line and the Ca $K\alpha$ line.

Table 1 Quantitative Value of NIST 1571 Orchard Leaves by FP Method

	Ca	K	Mg	P	S	Si	Fe	Mn
Measured Value (%)	2.149	1.648	0.769	0.213	0.205	0.167	0.032	0.010
Certified Value (%)	2.090	1.470	0.620	0.210	0.190	--	0.030	0.009
Accuracy (%)	0.059	0.178	0.149	0.003	0.005	--	0.002	0.001

	Pb	Cu	Sr	Zn	Rb	N	C₆H₁₀O₅
Measured Value (%)	0.009	0.004	0.004	0.004	0.002	--	94.785
Certified Value (%)	0.005	0.001	0.004	0.003	0.001	2.76	--
Accuracy (%)	0.004	0.003	0.000	0.001	0.001	--	--

Measuring Conditions :

Instrument : EDX-700	Power: 15 - 50 kV at 16 - 250 μ A
X-ray Tube : Rh	Dead Time 25 %
Filte : None	Measurement Diameter 10 mm
Atmosphere : Vacuum	Measurement Time 40 Seconds

The given specifications serve purely as technical information for the user. No guarantee is given on technical specification of the described product and/or procedures.