

THE NICODOM KIDNEY STONE ANALYSIS KIT

The NICODOM Kidney Stones Analysis software package has been created by spectroscopists and medical doctors to allow analysis of kidney stones using Nicolet FTIR spectrometers with OMNIC software. This kit consists of three parts.



NICODOM KIDNEY STONE LIBRARY - BASIC

This approach is not new and allows analysis of kidney stone samples by less qualified personal. The library of about 800 infrared spectra allows analysis with +/- 10% accuracy (error of 10-15 % is without clinical relevance according to Hesse). This accuracy varies for different mixtures, best results (error less than 5%) were reached for major components in concentration range of 30-70%. As far as no peak shifts were observed comparing spectra of pure components with those of real mixtures, spectra of conceivable mixtures were created by combination of pure components. On the other hand, pure kidney stones must have been used, because their infrared spectra differ from those of mineralogically or chemically pure substances. For example each real urinary concrement contains a low content of unknown "matrix". "Matrix" contains mostly organic components, that is why the SEARCH operation in the region of 2900 - 3100 cm⁻¹ can fail and thus searching in finger print region is recommended.

NICODOM KIDNEY STONE ANALYSIS

Advanced Analysis	
Spectrum title	Mr. Schüller
Collected	Mar/11/1995, 14:31:25
Component	Content
Weddellite	54 %
Uric acid	43 % (13 % dih.)
Matrix (unknown matter)	3 %
Reliability index 96 - Result is very reliable	
OK	Visual comparision
Reliability...	Comment

A combination of qualitative and quantitative analysis is used. The content of a component is calculated from the match values of search result using a coded library of over 18.000 spectra and special algorithms. This type of analysis rejects other than kidney stones spectra, corrects or rejects distorted spectra and has improved accuracy. Spectra of common artifacts, drug and rare stones are included. All results include reliability factor of the analysis and can be stored with the spectrum. Visual comparison of the sample spectrum with the theoretical spectrum is also an important feature.

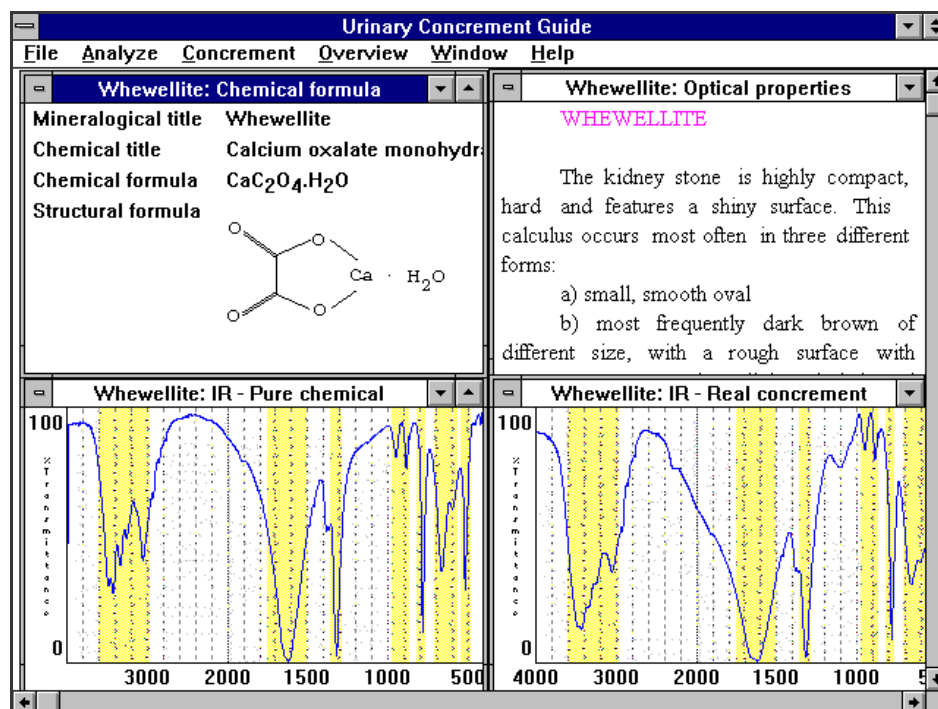
212 spectra files of real stones (found in human kidney) and 23 spectra files of major pure components are also included as examples to demonstrate capabilities of the software.

NICODOM KIDNEY STONE GUIDE

This part of the kit includes additional information about the kidney stones components.

Interpreted infrared spectrum of stone and pure chemical is included. Its Raman spectrum, picture of the stone, other methods of chemical analysis (qualitative, semiquantitative, quantitative), causes and occurrence of the component, optical properties, table of peaks, structural formula and other information is also included.

This guide also gives to the chemists a brief information about medical aspects of kidney stone analysis, like diagnosis and therapy.



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