

Measurement of Methyl Isothiocyanate and Other Insecticides by GC / FID – FPD

The use of pesticides and insecticides in the Agricultural Industry has always been widespread in the past. However, their use is now under close scrutiny by many consumer and government agencies since the short-term and cumulative effects of these materials has been shown to be potentially hazardous to humans and animals.

Many pesticides are based on derivatives of a simple molecule. In this application, the actual material being determined is Methyl Isothiocyanate, a sulfur derivative of the chemical *urea*. The Isothiocyanate is also used as a precursor for other pesticides and is one of the breakdown products of many other pesticides.

A gas chromatograph with a packed or macro-bore capillary column can be used along with a general use Flame-Ionization Detector (FID) to determine total carbon-aceous material and a sensitive Flame Photometric Detector (FPD) to determine sulfur-containing materials. Some representative quantitative data is shown below.

These analyses were researched and developed on a Buck 910 GC / FID-FPD system. Fruit, leaves, and beverage samples would be extracted with Ether : Hexan : Alcohol and run against calibrated reference materials for precise and accurate quantitation.

Results are single runs on GC system by manual injection.

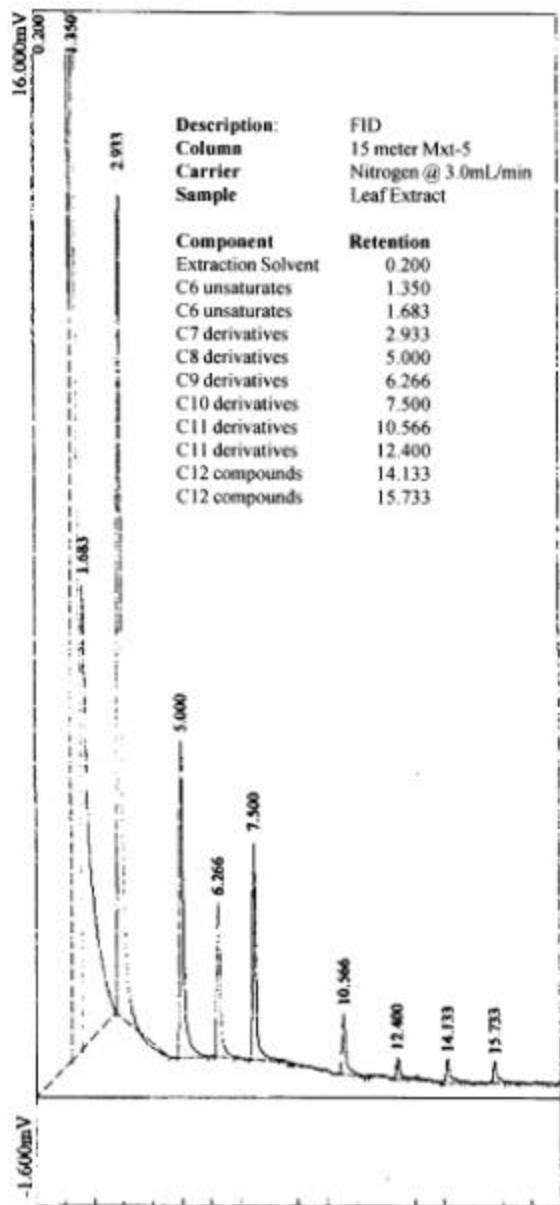
Samples: Grape leaves, grapes, and several Wine ferments (CA)

[Samples concentrated 10:1 to 100:1 with solvent extracts]

Sample ID	Assay by F.I.D.	Assay by F.P.D.
Leaves	125 ppb	140 ppb
Fruit	87 ppb	96 ppb
1 st . Must	63 ppb	75 ppb
Final Wine	<25 ppb	11 ppb

Complex mixtures, which wines and other agricultural based products certainly are, can be easily resolved into their individual components to allow precise and accurate analysis of toxic or undesirable materials. The ultimate flexibility of the Buck 910 GC design permits a wide range of testing capabilities, from major quantitation to trace characterization. This can all be done very economically and efficiently with just one system, saving space, money, and time.

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