ANALYSIS OF "DIFFICULT COMPOUNDS" IN FRUITS AND VEGETABLES USING MULTIRESIDUE METHODS

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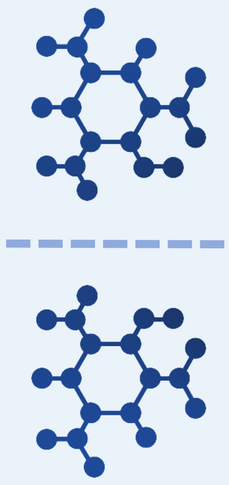
The extraction and analysis of certain compounds included in multiresidue methods entails difficulties that should be overcome to ensure the quality of the results. Some of the most commonly problematic compounds are described herein.

COMPLEX RESIDUE DEFINITION: MULTIPLE ANALYTES OR ISOMERS



Compounds whose residue definition includes a variety of analytes such as derivatives and/or isomers. The ratio of these components is not always specified by the vendors

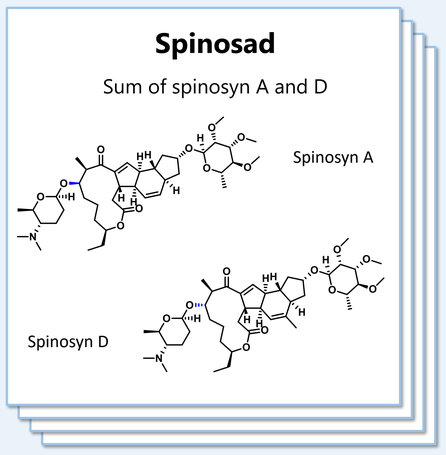
Abamectin – Avermectin B1a (2 isomers with UV interconversion), and B1b

Emamectin – Emamectin B1a (2 isomers with UV interconversion) and B1b

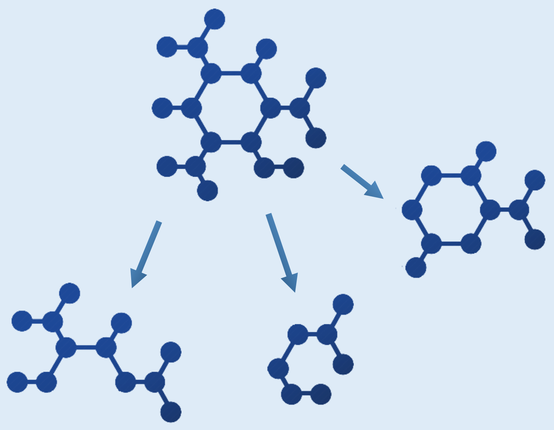
Spinosad – Spinosyn A, spinosyn D; **Spinetoram** – J & L

Cyhalothrin – Complex sum of stereoisomers resulting in multiple chromatographic peaks. Gamma isomer only separable by chiral column. Not all isomers approved for their use

Metaflumizone & Fenpiroxymate – *E* and *Z* isomers in variable proportions



COMPLEX RESIDUE DEFINITION: MULTIPLE DEGRADATION PRODUCTS



Compounds that degrade into multiple metabolites. Residue definition includes all degradation products

Amitraz - DMF, DMPF, DMA

Dazomet – methylisothiocyanate and metam sodium

Fenthion – sulfone, sulfoxide and their oxons

Methiocarb – sulfone and sulfoxide

Prochloraz – BTS 44595, BTS 44596, BTS 45186, BTS 9608, BTS 40348, 2,4,6-trichlorophenol

Spirotetramat - enol, enol-glucoside, monohydroxy and ketohydroxy metabolites

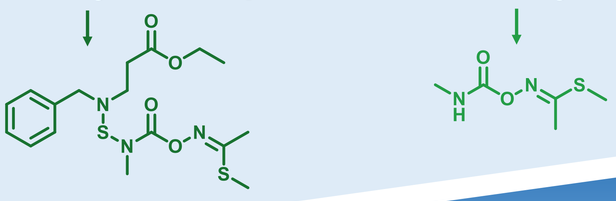
DEGRADATION INTO OTHER ANALYTES

Compounds that decompose easily into a metabolite that should be included in the analyses

Carbosulfan
Benfuracarb
Furathiocarb
} Degradation into **carbofuran**

Benomyl – Degradation into **carbendazim**

Alanycarb – Degradation into **methomyl**



DEGRADATION BY DIFFERENT CAUSES

Captan - Thermal degradation
Folpet - Thermal degradation
} **SFC** analysis
GC on-column

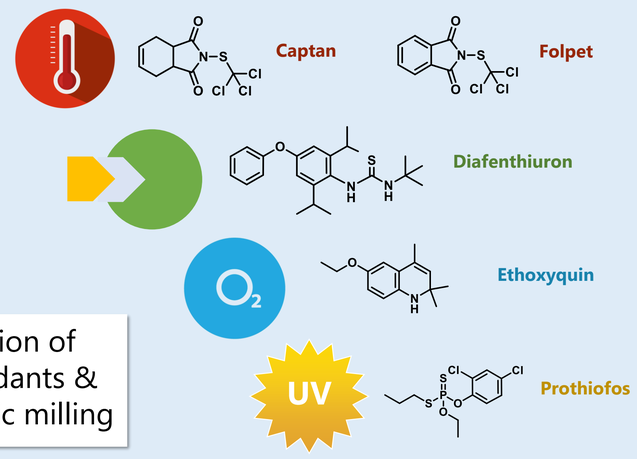
Diafenthiuron - Enzymatic degradation

Prothioconazole - Loss of the *thio*- moiety

Aniline - Oxidation in the absence of antioxidants

Ethoxyquin - Oxidation

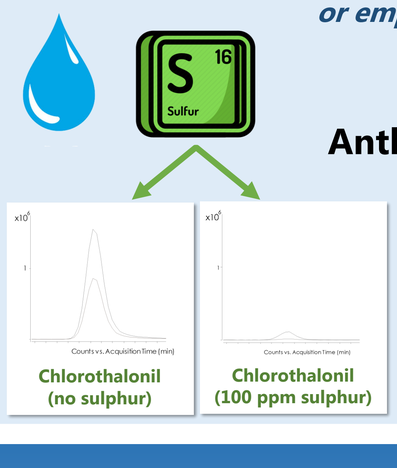
Prothiofos - UV degradation



Addition of antioxidants & cryogenic milling

COMPOUNDS AFFECTED BY OTHER COMPONENTS

The presence of sulphur (as a natural matrix component or employed as a plant protection product) or water affects the stability of these compounds



Anthraquinone – Water (coextracts interferences)

Chlorothalonil – Sulphur (degradation)

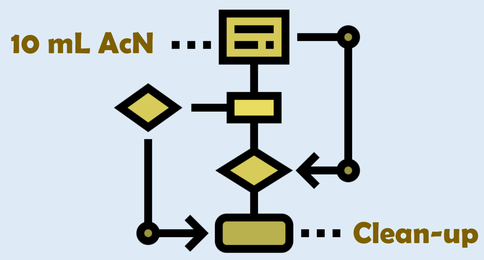
Carboxim – Sulphur (oxidation)

Fenthion – Sulphur (oxidation)

COMPOUNDS NOT SUITABLE FOR QuEChERS-PSA EXTRACTION PROCEDURE

Acidic or basic compounds that need acidic extraction (undergo hydrolysis in basic pH) and/or are incompatible with the use of primary secondary amine (PSA) in the clean-up step. Analyze an aliquot of the sample prior to the clean-up step.

MCPA	**MCPB**
2,4-D	**Fluazifop-P**
Haloxyfop-P	**Quizalofop-P**
Dithianon	**Dichlofluanid**
Tolylfluanid	**Ioxynil**



OTHERS

Compounds with difficulties different to those described above

Dichlorvos, biphenyl – Highly volatile

Bifenazate + **bifenazate diazene** – Interconversion

Nicotine – Adsorption into glass surfaces