

(39)

Analytical Research Division  
Research Directorate

19 Nov 84

Analysis/Evaluation of White Powders

A shipment designated 10027PPPP was received by the Analytical Research Division 13 December 1983 from FSTC. The shipment was identified with TH831117-1XX. No identification was made of the four subsamples. No information was available concerning the samples. Subsamples 10027PPPP-1 and -2 consisted of white powders, each individually containerized in plastic bags. 10027PPPP-1 weighed approximately 200 g and 10027PPPP-2 weighed approximately 50 g. (Figure 1). A spot report has previously been issued on these samples.

Vapor samples withdrawn from within each bag of powder were subjected to analysis by gas chromatography/mass spectrometry (GC/MS). Portions of each powder sample leached in chloroform formed a gel. Portions leached in 1:1 methanol:water did not gel. The solvent soluble materials were analyzed by GC/MS, ion chromatography (IC), thin layer chromatography (TLC), and infrared spectrometry (IR). Portions of each neat powder were analyzed by Atomic Absorption spectroscopy (AA).

10027PPPP-1

The GC/MS spectra of the vapor associated with the powder identified the major components as hexanoic acid and heptanoic acid. Minor components detected included octanoic acid, methyl naphthalene, toluene, benzaldehyde and t-butyl-isobutyl hydroxytoluene. The GC/MS spectra of the chloroform solubles identified the presence of propanoic, pentanoic, hexanoic and octanoic acids, their aldehydes, and aliphatic hydrocarbons from C25 to C30. IC was negative for all ions. No components were separated by TLC. Derivatization with negative ion chemical ionization MS detection for trichothecenes was negative. IR spectra identified the presence of the aluminum salts of hexanoic and octanoic acids. Elemental analysis by AA detected 7.89% aluminum.

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Declassify: OADR

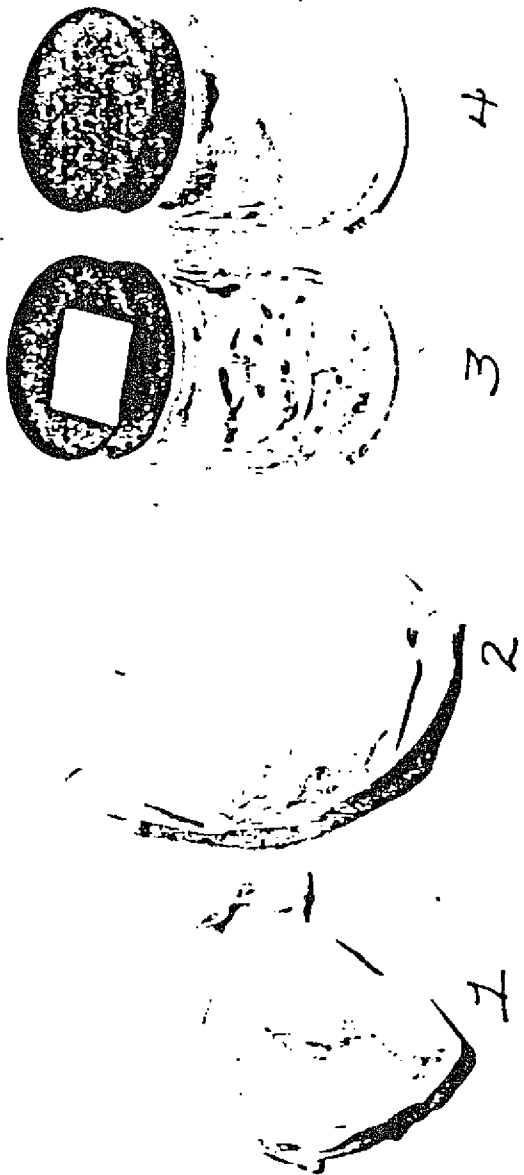
10027PPPP-2

The GC/MS spectra of the vapors associated with the powder identified only traces of xylenes. The GC/MS spectra of the chloroform solubles identified the presence of hexanoic and octanoic acids. IC detected no ions. No components were separated by TLC. Derivatization with negative ion chemical ionization MS detection for trichothecenes was negative. IR spectra identified the presence of the aluminum salts of hexanoic and octanoic acids. Elemental analysis by AA detected 8.75% aluminum.

Conclusions

No evidence of any known CW agents, agent degradation products, or trichothecenes was detected. The detection of hexanoic, heptanoic and octanoic acids and related compounds with approximately 8% aluminum agrees with the formulation of the M-4 thickener for Napalm. Each of these powders is a diacid aluminum soap of octanoic acids used in the M-4 formulation.

(p)



10027 PPPP

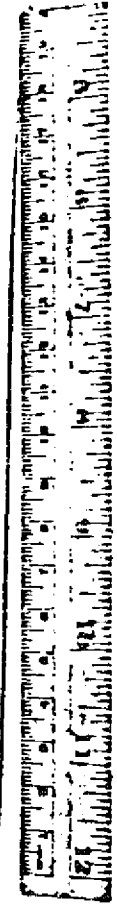


Fig 1

[REDACTED]

Analytical Research Division  
Research Directorate

06 Nov 84

Analysis/Evaluation of Paper

A shipment designated 10027PPPP was received by the Analytical Research Division 13 December 1983 from FSTC. The shipment was identified with TH831117-1XX. No identification was made of the four subsamples. No information was available concerning the samples. Subsamples 10027PPPP-1 and -2 have previously been identified and reported. Samples 10027PPPP-3 and -4 each consisted of paper containerized in a wide mouth screw top glass jar. 10027PPPP-3 was shredded paper, -4 was a folded piece of paper with Thai writing on it (Figure 1).

Vapor samples withdrawn from within each jar containing paper were subjected to analysis by gas chromatography/mass spectrometry (GC/MS). Portions of each paper sample were leached in chloroform. Other portions of each were leached in 1:1 methanol:water. The solvent soluble materials were analyzed by GC/MS, ion chromatography (IC), thin layer chromatography (TLC), and infrared spectrometry (IR).


10027PPPP-3

The GC/MS spectra of the vapor associated with the paper identified the major components as o-cresol and three isomers of dimethyl phenol. Minor components detected included benzaldehyde, phenol, benzonitrile, methyl heptanoate, p-cresol, acetophenone, methyl benzoate and methyl octanoate. The chloroform soluble materials did not give a definitive GC/MS spectra. IC was negative for all ions. No components were separated by TLC. Derivatization with negative ion chemical ionization MS detection for trichothcenes was negative. IR spectra identified the presence of aliphatic hydrocarbons, a carbonyl at 1720 cm<sup>-1</sup>, and possibly potassium nitrate, C-O, cellulose and inorganic silicate.

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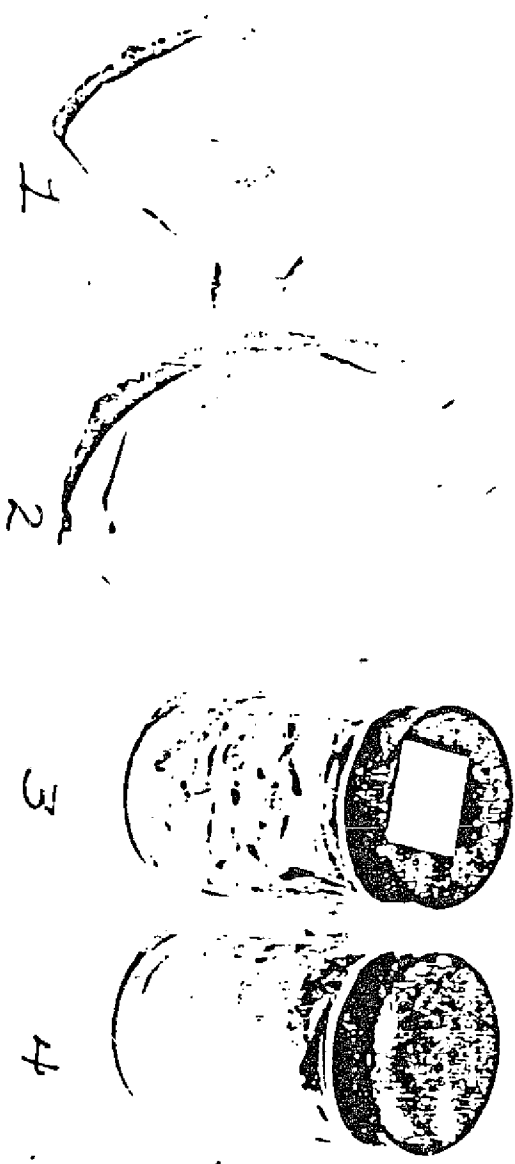
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10027PPPP-4

The GC/MS spectra of the vapors associated with the folded papers identified methyl hexanoate as the major component. Minor components detected included hexane nitrile, acetic acid, furancarboxaldehyde (2-furaldehyde), ethyl ether, xylene and possibly ethyl hexanoate. The chloroform solubles did not give a definitive GC/MS spectra. IC detected no ions. No components were separated by TLC. Derivatization with negative ion chemical ionization MS detection for trichothecenes was negative. The spectra identified the presence of aliphatic esters, a carbonyl and possibly C-O.

### Conclusions

No evidence of any known CW agents, agent degradation products, or trichothecenes was detected. The detection of hexanoic, heptanoic and octanoic acid esters could be related to the identification of 10027PPPP-1 and -2 as diacid aluminum soaps of octanoic acids. It is possible that the papers were in contact with the other two samples. Without any information about the samples, no further conclusions can be drawn from the analyses.



F0027 PPPP

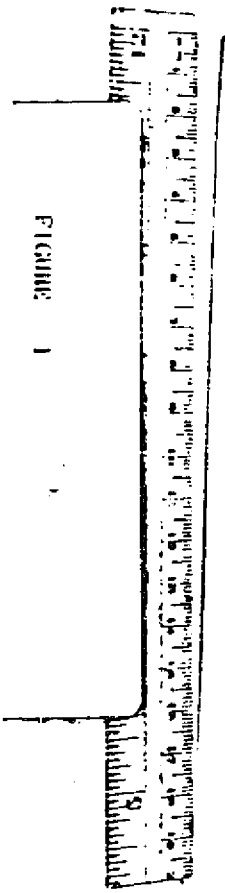


FIGURE 1

