

NOTEBOOK COMPLETION INSTRUCTIONS...

- AUTHOR'S signature on inside front cover
- SUPERVISOR'S signature on inside front cover
- WITNESSES' signatures on inside front cover
- ALL pages signed, dated & witnessed
- ALL supporting documents permanently attached, signed & dated by author.
- RETURN notebook to your designated record keeper no later than 1 year from date of completion OR if transferring, turn book in immediately.

TECHNICAL NOTEBOOK

117234

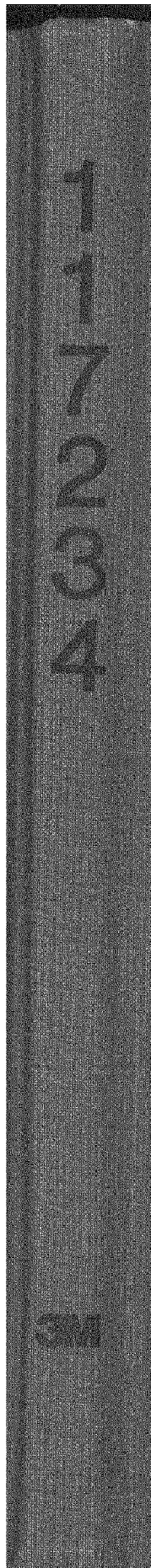
**Exhibit
2603**

State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862



TECHNICAL NOTEBOOK

117234



ON: May 22 1998 3M TECHNICAL NOTEBOOK NUMBER 117234
WAS ISSUED TO: Lisa A. Clemen REDACTED
OF THE Environmental Technology & Services
Laboratory

THIS NOTEBOOK IS TO BE USED AS: (Check the appropriate box)

☒ A TECHNICAL NOTEBOOK FOR THE ABOVE NAMED INDIVIDUAL, OR

☐ A LOG BOOK FOR _____
Name and location of equipment

FOR NOTEBOOK CENTER USE ONLY	THE WORK IN THIS BOOK COVERS THE PERIOD
	FROM _____ TO _____
	PRECEDING NOTEBOOK NUMBER _____
	SUCCEEDING NOTEBOOK NUMBER _____

SIGNATURE AND INITIALS OF NOTEBOOK ASSIGNEE AND ALL WITNESSES:

NOTE #1: (Print) YOUR NAME, (Sign) USING YOUR FULL LEGAL SIGNATURE, AND

SIGN (do not print) YOUR INITIALS.

NOTE #2: IF THIS NOTEBOOK WAS ISSUED AS A LOG BOOK, EACH PERSON
WHOSE SIGNATURE APPEARS BELOW MAY RECORD IN THIS BOOK.

<u>Lisa A. Clemen</u> Print Full Name, (Clearly)	<u>Lisa A. Clemen</u> Full Legal Signature	<u>LAC</u> Initials	REDACTED Employee No.
<u>Lisa A. Stevenson</u> Print Full Name, (Clearly)	<u>Lisa A. Stevenson</u> Full Legal Signature	<u>LAS</u> Initials	REDACTED Employee No.
_____ Print Full Name, (Clearly)	_____ Full Legal Signature	_____ Initials	_____ Employee No.
_____ Print Full Name, (Clearly)	_____ Full Legal Signature	_____ Initials	_____ Employee No.
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_____ Print Full Name, (Clearly)	_____ Full Legal Signature	_____ Initials	_____ Employee No.

FOR SUPERVISOR ONLY:

I AM ACQUAINTED WITH THE CONTENTS OF THIS NOTEBOOK.

_____ Print Full Name, (Clearly)	_____ Full Legal Signature	_____ Employee No.	_____ Date
-------------------------------------	-------------------------------	-----------------------	---------------

PURPOSE OF THE NOTEBOOK

This Technical Notebook is on loan to you by 3M. It is a legal record of your daily technical work. The manner in which you keep this record may determine its adequacy as evidence in a court of law in the legal matters concerning your work. In general, the more information the better. This notebook should be secured when not in use.

USE OF THE NOTEBOOK

Use this notebook as a diary — a place to record your efforts and interactions — and as your own personal reference book for information you have gathered. Use it to record all your research and technical work such as ideas, data from your experiments, illustrations of new devices, mechanical and electronic assemblies, process steps and modifications used in production, notes on materials used, references to related work and information on the first sales and field evaluation of resulting new products. *All entries must be made chronologically, as the work is done.*

The notebook may be used as a log book to monitor the activity of equipment including maintenance, calibration, and use.

WRITING STYLE

You are the author of this notebook; so, the writing style should fit your work needs. When you recognize that you have a new idea, write it down in detail and have it witnessed immediately (See DESCRIBING YOUR NEW IDEA below). However, discoveries when written in this notebook show how the discovery or invention occurred over time. Even cryptic notes, as for example, "Sam — lunch at 11:30 — Tuesday" or "need your temperature data on R33 program" show your activity and are useful. Also, your day may be filled with many useful, but disjointed, events; so, change topics and/or work directions by drawing a line between topics in the notebook to show the change in thought. Finally, if you are on vacation, leave of absence, sick, or working on another project for a period of time, make an entry to that effect to account for your time in any interval between adjacent notebook entries.

CORRECTIONS

Enter information into the notebook as you obtain it. It is accepted legal practice to make corrections with no more than one line drawn through the information. For example, if you record something that is wrong while you are making an entry in your notebook, just draw a single line through it and continue. If a section of information is wrong, draw a block around the information and a diagonal line through the block. The single line is important to show that you are not (in a legal sense) trying to conceal information. Another advantage is that sometimes you find the information (or idea) was actually correct and you will be able to retrieve it easily. If an entry is found to be erroneous some time later, do not go back to correct it; instead, make the correct entry on the notebook page you are otherwise entering information on in chronological sequence and refer back to the erroneous entry. Also, be sure to place a line through unused sections of any page.

DESCRIBING YOUR NEW IDEA

One major use of this notebook is in providing a date for an invention. For example, if at some later time you find that your discussion with "Sam" (see WRITING STYLE, above) has led to an invention, draw a line in your notebook when you last left off, place today's date below the line, and write your new idea with clarity and accuracy. Include the heart of your luncheon discussion with "Sam" (referencing back to the page with your cryptic note).

WITNESSING

Notebooks should be witnessed as soon as possible after entries are made, preferably within one week. The person witnessing your notebook entries should be someone who understands what you are working on, but not someone working on the same project with you or the supervisor or manager responsible for your activities. The witness must sign his or her full name or initials by the words "read and understood" and date each page. If the page is full of data, the witness is corroborating that data has been taken. If the page has the words, "Sam — lunch at 11:30 — Tuesday," the witness is corroborating not that you went to lunch with Sam, but that you wrote a note to yourself to be at lunch with Sam at 11:30 on Tuesday. If you have described a new idea, the witness is corroborating he/she has an understanding of the ideas described. *Remember, the witness date is the legal (corroboration) date of a document.*

INITIALS VS. FULL SIGNATURE

If witnesses use their initials instead of their full name, the first time they witness work in your notebook they must sign and print their full name and insert their initials on the appropriate lines on the inside front cover of the notebook. If witnesses sign their full name in witnessing, it is still necessary to have them sign and print their name and initials on the inside front cover, since some signatures are difficult to read.

ATTACHMENT OF SUPPORTING DOCUMENTS

Supporting documents should be attached permanently to notebook pages in a single layer using permanent double-sided tape or glue in such a way to ensure that they cannot be removed. Each attachment must be signed or initialed and dated by the author. Reference to other supporting documents not attached to the notebook may be made so long as those documents are retained permanently.

Computer diskettes may be attached to notebook pages so long as the author retains a duplicate copy and information contained on the diskette *supports* handwritten information recorded in the notebook. Diskettes are not to be used as substitutes for recording daily research activities in the notebook.

Each diskette is to be labeled with sufficient information to identify its contents including the type of computer and software used. In addition, each diskette must be signed and dated by both the author and witness using his or her legal signature; placed in a sealed, labeled envelope, identifying contents, with the envelope being permanently secured to the notebook page.

NOTEBOOK COMPLETION

When a notebook will no longer be used and is only partially completed the page following the last entry should indicate "no further entries" with the reason being stated. Both partially and fully completed notebooks should be signed and dated by the supervisor on the inside front cover noting that he or she is acquainted with the contents of the notebook, that the notebook has been properly executed, and that all witnesses have (clearly) printed their name, signed and initialed the inside front cover. Unused notebooks should be returned to the Technical Notebook Center, Building 223-BS-03. *If the notebook is being returned unused, there should be no signatures or date inside the front cover.*

A notebook may be retained for up to one year following completion so long as you remain in the same job and it is necessary for your ongoing work. After one year you must return the notebook to your Notebook Record Keeper. All notebooks must be returned to your Notebook Record Keeper before you transfer, retire or terminate your employment with 3M. Prior to returning a notebook to the Technical Notebook Center by the Notebook Record Keeper, one copy of the notebook may be made with the approval of the laboratory head if such a copy is necessary for your continuing work. Alternatively, a copy may be requested from the Technical Notebook Center. This copy may be retained by you for up to ten years after which time it is to be returned to the Technical Notebook Center. Because of the highly sensitive nature of the information recorded in your notebook, copying of notebook pages is not authorized except where requested by your Technical Director, Laboratory Head or Patent Counsel.

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DO NOT WRITE IN THIS MARGIN

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40		

DO NOT WRITE IN THIS MARGIN

[illegible]

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference: FACT Meeting

Products Per Fluorooctanesulfonate (Potassium Salt) = PFOS
 $C_8F_{17}SO_3^-K^+$

10

1. Fluorochemical Facilities

- Effluent Total Sulfonate based

2. Toxicology

- studies by time

3. Food Transfer

- to rest of year

4. Human Exposure

- package / wrapping

5. Other products

- Toxicology / what levels

- carpets

15

Electrochemical Fluorination - fluorochemical with a unique pattern
 containing straight + branched chains
 Dupont - straight chain only

20

3 major products containing fluorochemicals

1) Coating on packaging - grease resistant

2) Scotch guard

3) Triple F - fire fighting foam

25

30% remaining - CFC replacements

30

FC-807 ether mixture + expose to H_2O - breaks down to PFOSIn 1974 Fluorine amounts in H_2O Inorganic - H_2O Organic - Not from H_2O

35

Levels which have been found

PFOS

↑ 70 ppm

40 - 90 ppb in

PFO

↑ 100 ppm

Human Sera

Need to identify route of entry

AUTHOR'S FULL NAME or INITIALS Don A. ClemDATE: 5/22/98

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 5/12/98

Objective:

5 Reference: FACT meeting

Isomer ratios of PFOS to determine root cause (Instrument - electrospray)

Some ideas for cause

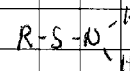
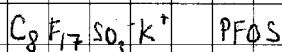
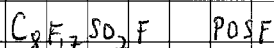
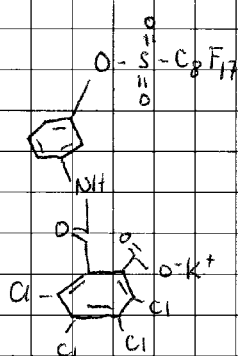
10

1) Carpeting - Scotchguard started to make in the 1960's

50% is gone in one year - dust

- coating on carpet not covalently bonded
- polymerized solution sprayed onto carpet & then steamed out

15



20

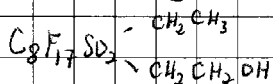
Rats (sera)	Standard Mat	Sera (G.P.)
37% → 55%	~75% linear	65%
50% → 40%	~20% 1 branch	35%
13%	~3% 2 branches	N/A

25

K-Salt

2) Food packaging - Scotchban

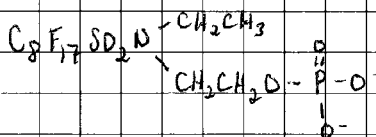
30



Ethyl FOSF Alcohol

 $\frac{1}{2}$ life = 25 years

35



No others are sulfonate based like 3M.

AUTHOR'S FULL NAME or INITIALS Alice A. ClemensDATE: 5/22/98

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 5/12/98

Objective:

5 Reference: Continued from page 7 - Fact meeting

20 years ago all fluorochemicals were from 3M

10

Toxicity - not toxic and we need to continue to show this. 2-3 times higher in plant workers than general public with no harmful effects

15

Current Extraction procedures and analysis
- Ion pair and electrospray analysis validated

20

- IC analysis - can detect 6 peaks not validated.

DO NOT WRITE IN THIS MARGIN

25

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

5/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

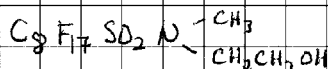
1 PROJECT NO.

SUBJECT:

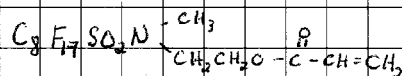
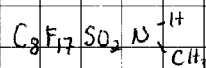
117234 DATE 5/12/98

Objective:

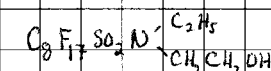
5 Reference: FC-845 Components

can't polymerize Methyl FOSE (557)

10

not polymerized Methyl FOSEA (611)
residual monomerimpurity FOSE Amide (513)

15

Surr./Int. Std Ethyl FOSE-OH (571)

20

25

30

35

DO NOT WRITE IN THIS MARGIN

LAC 5/22/98

AUTHOR'S FULL NAME or INITIALS Lisa A. Clement

DATE: 5/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 5/26/98

Objective: Determine Root Cause of Contamination

5 Reference: FACT meeting

Method Development

10 Carpet extractions - Glenn L + Ogi

Not GLP extractions for GC + LC profiles

15 paper packaging
Scotch guard

20 Need to resist Fish - file (PFS) + Chicken (in packaging)

* Buy Chicken Liver for extraction - determine background levels

25 Current Samples in-house Air filters 2-6 month + new carpet
Vacuum bag + contents
Swipes/dust samples

3 Scotch guard formulations

7 Samples of Carpet with scotchguard ext with H₂O
ext with MeOH

2 samples untreated carpet

2 samples with Stainmaster (Report)

Ideas

35 ATD - Fibers

Extract dust with MeOH, H₂O

ATD - Extract

Swipes => 1ml MeOH

FIA - Extract

Stability Study - MeOH + H₂O which is better LC/MSAUTHOR'S FULL NAME or INITIALS Ann A. ClemensDATE: 5/26/98

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 5/27/98

Objective:

5 Reference: Tox meeting Andrew, Kris, Don, John B., Dene, Mark E., Mary C.

Rabbit studies T-6555, T-6591 6329-201, 6329-202

Ethyl FDSE - OH plus other contaminants FC-807

10

3 Studies

1) Commercial packaging monoester (10%) Food transfer study (FC807)

a) microwave combine with 3

b) french fries

c) baking

d) pizza - fluted liner

? Is monoester in product

OK to keep in?

Does it transfer?

Amide
Chloride

15

2) FC-845 food migration sandwiches/steak

Methyl FDSE - OH

dimethyl

Methyl FDSE Acrylate

monomethyl

Methyl Amide

+ alcohol adduct

20

3) microwave popcorn "future FC-807 family" 10% Monoester < 1% Total

- 1 month

inner/outer liner + then popped/extracted extreme 0.02-0.04% total

25

Analytes - Ethyl FDSE - OH, Amide, Chloride

hydrolysis of monoester - didn't see after _____ hours
originally lost it.

30

possibly metabolizing to alcohol in the body.

35

To Do: T-6924 Characterization required
T-6925 Lactose212 meeting
183 Chow samples

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 5/27/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 5/29/98

Objective:

5 Reference: Toxicology meeting

PFOS, PFOSA, PFOSAA → MeFOSE

✓ to see if we've received any packaging from Covance

10

222 Sera + Liver from both dose groups low + high at study end

1) Liver Ethyl FOSE Rats 222

2) All Ethyl FOSE 222

3) Monocaster Rats June 15th

4 wk range finder PFOS Monkeys

2 mg/kg/day

in-house Non-GLP

.02

15

* Need to validate Sera + Liver (monkey)

* Order TWEEN 80 from Sigma

✓

20

Liver approximately 20 X higher than the sera levels

ADME Studies Tellimer Non-GLP for screening only

25

- Dosing solutions 2 gen

- Stability studies not GLP just documentation

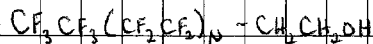
- Water 0.5% Tween 80 ground + heated

- Verification of concentrations

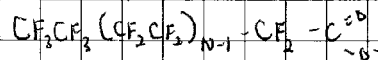
30

- Conc. verification for the 4 week PFOS monkey study in Lactose
not full GLP - just verification ADME => 50 mg/kg

35



metabolized to



Carboxylates

Dupont - linear Tellimer Alcohol

AUTHOR'S FULL NAME or INITIALS Lin A Clemen

DATE: 5/29/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 6/22/98

Objective: Find a system for archiving data for easy retrieval

5 Reference: meeting with Scott Swidersky from Quality Associates (QAI)

Archiving - managing data

10 QAI does the conversion work into one system - one format
 paper > CD
 electronic

1) Database

2) Imaging - maintaining this only - will also have Table of Contents

will help to have consistent data entry between groups
 - file org., process, centralized location, controlled

- Can set up securities

- Check that all pieces are included into archive

- Sets up a tracking sheet to ensure nothing is missed

- Documented + Retrivable

TF - file format for all the files

Need to standardize Acrobat Reader

* Send two studies for QAI to scan into CD

* 6329-15

6029-184

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 6/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 6/25/98

Objective: Determine Scheduling for Instruments

5 Reference: FACT meeting

FCF

- 10
- 1) Cell Samples - from Decatur 1/100,000 dilution
 - 2) Decatur Process -1 Check Tucker over weekend
 - " " -2
 - " " -3
- ↓
- 3) Carbon Samples
 - Charcoal Filters 6/25

Corn Oil

MDL Study - GC 6/26 Freddie

- LC 6/26 Chick

Tox Studies

- 20
- (M) WK 4? WK 8 WK 14 2yr E+FOSE
- (A) WK 4 Sera + Liver 2yr PFOS
- (M) T-6997 monoster - 6/26

used to find

* Liver

PFOSA + Monoster

ext vs nonext. curve test

Also bovine, rabbit, rat

curves need to check

ext efficiencies

General Environmental

- 30
- 1) Pig's Eye Samples - Treated Samples
 - 2) Fish - ABC Redo extractions ADME for PFOS + E+FOSE
 - 3) Chicken - Wildlife Redo extractions " " " "

General Experimental

- 35
- 1) Empore Cartridges - Confusing results nothing consistent will reext
 - 2) Empore efficiencies -

Sera - high levels of PFOS + Ethyl FOSE in blanks (1ml each)

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 6/25/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 6/25/98

Objective:

5 Reference: FACT meeting continued

6/25/98

Chick or Tucker
Carbon (FOSE)
Cell Sample
Decatur

10

6/26/98

Chick
MDL Study
PFOSEA ext efficiency

15

Tucker
Process Stream, IP

20

6/29/98

Chick
MDLTucker
Ext. Efficiency fish/chicken pigs eye

25

MeFOSE-OH - find standard

30

35

LXC 06/25/98

AUTHOR'S FULL NAME or INITIALS Lix A Clemen

DATE: 6/25/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 6/27/98

Objective:

5 Reference:

- 1) Tween 80 Check or Thor Not GLP
 PFOS
 EtFOSE

10

- 2) ^{uc}
^{6/27/98}
~~Don~~ Cartridges (Empore)

- a) Centrifuge
 b) Ion Pair w/ TBA (dilute sample 1:1 with Sera)
 c) 2 washes with organic
 d) Ethyl Acetate wash 2x + 4x
 e) Diethyl ether wash 2x + 4x

15

Other suggestions Adding Buffer
 Tween
 Homogenize with Ion Pair

20

- 3) Human Sera + Cal Checks spike w/ everything

- 4) Plasma (30 ml Rabbit in house) Test ext procedure
 Liver > Validations include PFOS, PFOSA, PFOSAA, Monoester
 Sera POAA, PFOSEA, EtFOSE-OH, Surrogate

25

Corn Oil
 Monkey - protocols
 Homogeneity dose prep verification
 Filters - ogi

30

35

LAC 06/27/98

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE: 6/27/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference: Corn Oil Mbl meeting

To Do

Remake new Diethyl Amide standard - GC DL 10ppb in MeOH
0.10ppb in Corn Oil

PEOSEA - LC

1.25 ppb in MeOH
0.125 ppb in Corn Oil

ETFOSE-OH-GC 250 ppb in MeOH
25 ppb in Corn Oil

Not ext can inject non ext curve

	EA	DEA	OH	CI
MeOH	1.25 ppb	10 ppb	250 ppb	25 ppb
Corn Oil	0.125 ppb	1.0 ppb	25 ppb	2.5 ppb

Ethyl Amide made by OK 3/24/98 2214 ppm

W398-567

S398-147

TW-A-1885

568

569

WAC 07/01/98

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 7/01/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference: Tox update meeting

Empore Cartridges - need to order more
try SDB + C₁₈

10

Rat Feces + Fat
Monkey Feces (more fatty) + Fat
Fish fat extraction - received 3 fish ROY to dissect

15

212/228 Grps 8 + 9 FOSE UTD
212 Grps 1 - 5 FOSE Sera UTD (MA)
Liver
202 Livers Renin + need to be audited (CT)

20

183 Sera + Liver Dilutions - Reductions (MA)

T-69971 Livers Monoester Method Development (MA)

454-101 Chicken Analyze 7/1/98 (MA)

25

ABC Fish Analyze 7/1/98 (MA)

Extractions

30

Extract Tween Solns vs non extracted standards
Rabbit Serum ✓ to see when to arrive then validate here 7/02
Urine Extraction - Need to order control
Liver Validation - All Analytes

35

Interim Report Template

AUTHOR'S FULL NAME or INITIALS Lisa A. Clamen DATE: 7/01/98

WITNESS'S FULL NAME or INITIALS DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/02/98

Objective:

Contract Labs
both GLPBatelle (Ohio) Gov't
Northwestern Bioanalytical Lab
- human work (Utah)
- Tox/Analytical Syex 8005 = Quattro

5 Reference:

Tox Planning meeting

Batelle - val. monkey, Rat, Rabbit - PFOS
↑ - can dose to analyze - Quattro II
more instrumentation Extrel mcpas platform LC's

10

Sept

11/15/98
WK 27 #1832/1/98
WK

15

August

#187
WK 14#212
WK 27#228
(50,50)

WK 27

20

July

WK 4 230 (8 liver/30 sera)
monkey

#228 (50,50)

WK 27

30

June

up to date
started
need to
analyze
apexWK 4 183
WK 4 183store
Analysis
need to
analyze
200
Livers

Liver

20/202

35

Thru WK 14
#212#226 1700 monkey parts
#222 PFOS monkey (100 sera/liver)
#1997 Monoclonal Rat
up to date/complete

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 7/02/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/02/98

Objective: Background information

5 Reference: Food Simulating Liquids

Now 10% EtOH:H₂OIn the past 8% Ethanol: H₂ONot very soluble in H₂O - diluted with Acetone
Shaken to ensure everything went into solution.

10

Noticed high Ethyl FOSE-OH response from monoester + diester
breaking down to Ethyl FOSE-OH in the injection port.15 Solvent used to separate the esters from the FOSE-OH -
Methyl tert Butyl Ether (MTBE)Some Acetone is picked up by the MTBE possibly by
diethyl ether. Not as clean as MTBE some interferences

20

EtFOSE-OH External Standard, No Acetone, sonicate + shake
before extracting Curve 0.5 ppm - 10 ppm

25

Ion Pair 10% Ethanol
90% H₂O

20 ppb - 750 ppb PFOS + Amide

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

7/02/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

117234
DATE: 8/

Objective:

5 Reference:

10

15

20

25

30

35

DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS Jim A. Clemens DATE: _____

WITNESS'S FULL NAME or INITIALS _____ DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

Objective:

5 Reference:

10

15

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DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS Lisa A. Climer DATE: _____

WITNESS'S FULL NAME or INITIALS _____ DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

Objective:

5 Reference:

10

15

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25

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DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/22/98

Objective:

5 Reference: FACT meeting

1) Shifting people Bob helping Lisa D + Kent L. on Food Transfer Study
 Jan helping Jay S. + Steve S. on Facilities

10

2) Alternative analysis of PFOS in Sera LC/MS/MS currently being utilized
 What to try next? Some options on confirmation 1) NMR → detection limits
 30-50 ppb in sera may need to conc 2) IR not as great
 3) high resolution MS not as sensitive

15

Tried a scale-up to conc. - didn't work

3) Two similar compounds PFOS = 499 Stephanie
 $C_8F_{17}PO_2H$ = 499 (Fluorowett) Antwerp joining our lab
 possibly by Hydrocarbon in Sept.

20

Possibly deuterate the compound
 and the internal standard $C_8F_{17}S$ Fluka vendor ✓

25

30 ppb - 100 samples combine the extracts to have 10 ppm & volume = 1.0 mL
 * Try a scale-up 5 mL → 1.0 mL add a step of 5 mL MeOH blow down - 1 mL
 Human Sera 10 mL → 1.0 mL + spikes at 100 ppb
 2.5 mL → 1.0 mL
 → Talk to prep lab

30

- Any development work use a pooled sample not an individual sample (Sera)

- TOX # LAD will start a folder

35

4) Decatur / Antwerp Characterize Dohmann - free fluoride & inorganic
 TF Total Fluorine = Inorganic + organic + free
 TOF Total Organic Fluorine by subtraction
 ADF Absorbable Organic Fluorine Empore / Combustion (Heraeus)

AUTHOR'S FULL NAME or INITIALS Lisa A. ClemensDATE: 7/22/98

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/22/98

Objective:

5 Reference:

FACT meeting cont.

TOF - ADF $\Rightarrow$ can be significant (40%)
Should be the same conc.

10

We can determine Total Fluorine
Inorganic Fluorine
uc 7/22/98 $\neq$ Free Fluorine

Techniques to identify non-GC + non-LC

15

a) Try SDB filters

b) Pt + Post empore

c) uv detector or evaporative light scattering detector

20

Food Transfer

Corn Oil / MeOH works well for E+FOSE-OH
not for E+FOSE-Cl + ethyl amide

25

will need to validate the methods

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

7/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/22/98

Objective:

5 Reference: Tox meeting

PFOS data only now

EtFOSE studies Rats - PFOS ↑ wt ↓ in animals

PFOS ↑ Cholesterol ↓ in animals

Issues we need to address

Schedule of Projects

1) High level contamination - controls liver > 1 ppm Sera >
from Covance2) Low level contamination
background in all animals
2 ppb Rabbits Sera
Monkeys Sera
5-10 ppb Rats Sera

3) Dose Confirmation

a) Argus TWEEN surfactant not Toxic (Carcinogenic) .5%
b) Lactose @ Covance w/ PFOS 2%

4) Update on 2 year PFOS Rats 183

5) Update on 2 year EtFOSE Rats 212/228

6) Update on 4 wk PFOS - Rat Monkeys (222)

7) Update on ADME monoester T-6997.1 + T6997.2

8) Update on Naive Rats T-6316

Batelle Finished Sera Validation for PFOS in Rabbits
Rats
Monkeys

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

7/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/22/98

Objective:

5 Reference: Tox meeting 401

1) Control animals mirror study animals 500-1000 ppb
Two air samples show EtFOSE
One out of four feed samples had EtFOSE ~70 ppb

10

2) Seen low level contamination in all animals sera < 10 ppb
- Haven't received 3 batches of rat chow
- Monkey biscuits

15

3)

20

4-8) Print out the abbreviated Excel forms put into packets

25

6) ^{FC 807 monobacter} Does get metabolized to PFOS T-6997.2
will probably have more studies started

30

To be arriving

FC-129 closed animals

Carance

SCD

New products

35

Argus

APPO/POAA

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemen

DATE:

7/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 7/29/98

Objective:

5 Reference: FACT meeting

1) Designate a week for method development

Aug 17th - 21st for Tox developmentAug 16th - 14th Facilities development

10 Aug Food transfer development

Corn Oil Validation - need to extract for analysis

DO NOT WRITE IN THIS MARGIN

15

- Human Sera Scale-up worked well

- Rat Urine - Didn't look great w/ only 1/3 of samples analyzed

- Lactose extraction - PFOS moderately good ext.
reextract a blank* Aug 7th

20

+ Call Corange + ask where they received their Lactose
how it was received - containers? bags?

+ Call Sigma + ask where they are getting their Rat Sera

25

+ 2nd set of Naive Rats check to see where they are in the extraction process.

+ Find the dose compound used in the Food Transfer Study

30

35

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 7/29/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/05/98

Objective:

5 Reference: FACT meeting

1) TOF + ADF differences

Cis vs anion exchange disk

- binding irreversibly or not at all?

SDB disks

if polar anion exchange will bind with component then need to displace with another component.

Another detector UV-VIS

↓ connect to Tacker so masslynx

will monitor both UV-VIS + ms

2) Fish method development - grinding all + analyzing the fish (Daphnia) for Total Fluorine + fluoride specific using Dohmann, etc. (Rich)3) Rat Chow / Corn Oil Extractions

- Try using another procedure - sulfuric Acid digestion to eat up fats, proteins, chlorophyll, or other interferences.

- change parameters ^{temp} not heating up past 200°C to release EtFOSE-OH + not the fats + proteins.

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemen

DATE:

8/05/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

8/07/98

Objective:

5 Reference: Method Development Ideas

Major Challenges

FC-129 Absorbed + Converted to PFOS

Monoester → Converted to
EtFOSE-OH PFOS

10 → Looking for a unique marker (not PFOS)

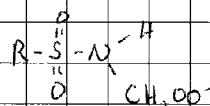
1) Metabolite Identification

* FC129

* Monoester

* EtFOSE

Fish + Chicken metabolite



Primary Acid Acetate

PFOSPA (556)

2) H.S Scale up 10 mL → 1.0 mL

worked well

(400 ppb)

also see PFOSAA,

need to confirm PFOS 20 mL → 1.0 mL

not sure

(800 ppb)

Amide, + others

HRMS, NMR → UAB
KOH
HOS

more interferences

- Empore Cartridge extractions Liver didn't work well + sera not very well either possibly try

3) Confirmation of PFOSA, POAA, PFOSAA*

- Order more sera

- 10x extraction

- derivatize POAA - GML

GC/AED + GC/MS - GC/EQD = PFOSA
= PFOSAA

Rats - need to extract the high dose Liver samples for NMR analysis.

4) Extractions

- Urine - Empore Day + Night

- Feces

- Liver

- Fat

- Sera ~ 75% recovery

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemen

DATE:

8/07/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/07/98

Objective:

5 Reference:

1) Homogenize with 1:5 Methanol then add Perchloric Acid (Liver)
Acetone HClO₄

10 2) Feces rats, monkey have more fat

3) Chromatographic Conditions improve time & sensitivity for the following:

Mangestor/EFOSSE/PFOSAA

- Positive/Negative instead of only negative

- re-tune in mobile phase, new columns

DO NOT WRITE IN THIS MARGIN

15

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AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 8/07/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/11/98

Objective:

5 Reference: Batelle Studies - Covance subcontractor for analysis
Ohio Jan White talk to their QA officer

When writing the protocol include that Batelle will be analyzing the samples

10

* Providing data to [Marv Case
Study director or Lara Anderson]

to PAZ and then we will [Tommy Johnson - needs these studies to be sent w/]
forward the package to Study Director

227
229

DO NOT WRITE IN THIS MARGIN

15

* Setting out Quality Objectives for the labs to meet

- Copies of what we received and attach to Chain of Custody
- When they ship then send the original with the samples.
- 20°C ± 10°C

20

- Form to send the test substance

25

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AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 8/11/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

11 7234 8/12/98

Objective:

5 Reference: FACT meeting

Iva pair vs Empore = very similar results on LC/MS

10 Not accounting for the following polymeric material

Large nonpolar

Small polar thermally labile

15 -Treatment- no heating during this treatment of wastewater

-GC analysis trying different columns to get an idea of what will work best for the following - acids, high molecular wts
polar, volatileuse as a
screening
method

20 -Possibly try the evaporative light scattering detector

DO NOT WRITE IN THIS MARGIN

25

30

35

AUTHOR'S FULL NAME or INITIALS

Alex A. Climen

DATE:

8/12/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

8/13/98

Objective:

5 Reference:

- Check into archiving data from 1979 + 1983 or any other relevant data packages which deal with PFOS or any other fluorochemical

10 the data from 1979 + 1983 were Radio labeled isotopes performed at Richer

- Organizing the tissues + fluids stored in freezers - ~~A~~B C D E F G H I J K L M N -

Set up

F-10 F-9

Bob finished
F-8 F-7

F-6

F-5 X-Serch finished

F-4 H

FACT Cage

Main Cage

3rd flr in Eastox Freezer F

F-10

F-9

F-16

Control Anticres

F-8

F-7

F-5

F-6

F-4

F-17

Organic cage current
set-upPilot
Cage

F-18

F-14

F-15

L A

H

K

J

F-13

F-12

F-11

I

Cooler Cooler

Prep lab helping organize all freezers

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 8/13/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

117234

DATE:

8/13/98

Objective: Method development - to improve the extraction efficiency of PFOS + other fluorochemicals from biological matrices

5 Reference: Mark Ellefson

Perchloric Acid Extraction Method

10

8/12/98

1. Homogenize 1.0 g of liver in 5.0 mL of methanol for 1 minute.
2. Add 1.0 mL of perchloric acid reagent (while vortexing).

Perchloric acid reagent (recipe for 100 mL).

70.0 mL of acetone
10.0 mL of Conc. Perchloric acid (70%)
20.0 mL of MilliQ water

Don A. Climen
8/13/98

3. Centrifuge at 2,000 rpm for 10 minutes to spin down the precipitate.
4. Remove an aliquot of supernate.
5. Adjust pH (optional)
6. Analyze

4 H₂O BIKs, 4 Rabbit Liver BIKs + 4 Spiked @ 100 ppb FC mix Liver samples were extracted using the above method. at step 5 half the samples were not pH adjusted and half were adjusted to pH ~7.

30

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AUTHOR'S FULL NAME or INITIALS

Don A. Climen

DATE:

8/13/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/18/98

Objective:

5 Reference: Meeting between Kris Hansen & Marv Case

Two studies will be started using PFOS + EtFOSE. We will be validating a method using milk. A good substitute would be to use whole blood since milk is hard to find.

10

Milk has more fat + sugar than whole blood but both have the same amount of albumin.

- Order whole blood from Sigma to test extraction method (Ion Pair) ✓ Received from Andrew Isacat

15

IF the method works then start a validation for PFOS, PFOSA, PFOSAA, + EtFOSE-DH.

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DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

8/18/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

DATE: 8/18/98

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference: Tbx update meeting w/ Dan Hales, Deanna Nabbefeld, Andrew Seacat, John Bufabiti

Naive Rats - Liver finished, wait for sera

10

Rat Chow - Tecnic Farms - TAC#31 Penn. Fish meal in the listing of the
Teklad - Harlan Madison diets used in the two Rat groups
Covance with high PFOS levels
Charles River Missouri

2.2 mg

15

* PFOS in Chow samples - Harlan Chow

20

Argus are the primary studies to work with.

25

Validation in Urine

- PFOS mainly + possibly metabolites
- Total Fluoride
- Telemar

organic compounds attached to
glucuronides (sp)

ADME monkey study

30

Extract Day 4 0.1 + 0.01 mg/kg dose levels + controls (all) Serum
~ medium - low priority

0.1 mg/kg + 0.01 mg/kg Orals + IVs

35

F 1:5

m. 1:2 goes up

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 8/18/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/19/98

Objective:

5 Reference: FACT meeting

Human Sera ext. efficiency 70%
Rabbit Sera ext. efficiency 20%

10

Try extracting using an enzyme to break any bonds which might be interfering.
- an acid digestion also to breakdown proteins etc. which interfere.

15

20

Sent an e-mail to Deanna Nabbefeld asking about the
Rodent Diet + Rat Studies

25

Charles River	- PMZ, S002	Purina Mills Chow	Raleigh, N Carolina
Harlan	- Harlan Teklad Chow		Indianapolis, Indiana
Taconic Farms	- TAC #31 Chow (Zeigler)		Germanstown, New York

30

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LAC 08/19/98

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 8/19/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/26/98

Objective:

5 Reference:

- Spoke with Missy Miller @ Battelle about protocols 6329-227, -229
everything looks good just a few minor changes. Ready for Study Director
signature Direct 614-424-7942 ✓ 614-424-5721 FAX

10

- Andrew Seacat
Chow #5 - need to talk with Kris ✓ 8/31/98
Dose verification - low ✓

15

- 6329-230 Liver Results
Faxed to John Butenhoff + e-mail to him + Paul Lieder

- Andrew Seacat
Send Naive Rat graph via e-mail ✓
Need to determine levels in Rat rooms at Corvance

20

- To Do Rat Urine Validation
Order cartridges
Bird Liver dilutions - RWW ✓

25

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AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

8/26/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 8/31/98

Objective:

5 Reference:

Andrew Seacat - sent 183 Liver file via e-mail
- done verification questions - still low w/ correction
+/- 15% is criteria for done verifications

10

Wayne from QAT called about Data for CD 410-884-9100
1 study per CD was what he asked about
and what was agreed upon.

DO NOT WRITE IN THIS MARGIN

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AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemes

DATE:

8/31/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 9/2/98

Objective:

5 Reference:

Need to validate Whole Blood for the following compounds PFOSBA,
PFOS, PFOSA, PFOSAA, & EtFOSE-OH extracted by ion pair

10

Validate Urine method using empore method for all components.

Extract Liver samples for Argus 418-008

15

FACT meeting 1 pm -

Food extractions looking for monoester

20

1) Extract for Ethyl FOSE-OH then convert all to ethyl FOSE-OH from monoester
& then subtract for the monoester value. Assuming all from monoester.

~~X~~

Deceatur/Antwerp

25

- Looking at any FC compounds that are converted to PFOS
Acid digestion was used to drive compounds to PFOS

30

35

AUTHOR'S FULL NAME or INITIALS Chris A. ClemensDATE: 9/02/98

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

9/02/98

Objective:

5 Reference:

Document Retention - PFOS based work only -

Technical data

10

Control set up at the beginning

1) Ensure keeping everything separate

2) Lab notebooks, correspondence, etc. in a separate file

3) Need to know where all the FC data is located

15

4) Drafts don't need to keep with final report - dispose of this work unless need to per GLP

5) Final Reports keep

6) Distribution of reports - only to those people who requested the analysis.

7) Stamping data with the NOTICE statement (see below)

20

IF package is bound - only need to stamp the original front page
don't need to stamp every single page* Notice Statement = Attorney Client and Work Product Privileged
Do not copy - Do not disclose
3M Proprietary Information

25

Ask Dale for dates on the FC Data Project
- Blood bank samples

8) Clean out computer of all electronic data

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

9/02/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 9/09/98

Summary of Methods Development future needs:

Sept. 14 - Oct. 15

30 day

- Nov. 15 60 day

- KRL/HOS (2) 1) Ground water, drinking water, river water - Quantitative to ppt levels 30 day 5 ppt MeFOSE, PFOS, EtFOSE, PFOS A, AA
- LAD (2) 2) Food products: bread, milk, eggs, pork (ppt) - Tentatively looking for PFOS, MeFOSE, EtFOSE 30 day *
- JJ (2) 3) Sediments (ppt/ppb) EtFOSE-OH & metabolites possibly MeFOSE, EtFOSE 60 day
- JJ (2) 4) Sludge, microbe degradation of EtFOSE-OH (ppb/ppm) + FC129 60 day * initiation indep. of FACT
- (4)^x 5) Municipal sludge (ppb/ppt) looking for PFOS and metabolites - from clothing, etc. Contact: FACT Team - KJH
- SPS (1) 6) Acid digestion - Total PFOS, PFHS, etc. 30 day Contact: FACT Team - KJH
- MEE (2) 7) Expansion of LC to include alternate detectors - LC/MS & LC-Ultraviolet/Evaporative Light Scattering-MS 30 day Contact: FACT Team - MEE and SP Team - TLH
- LAD (1) 8) Monoester from food and food packaging (FC-807) tied to #2 30 day Contact: FACT Team - LAD
- ~~9) Carpet chemistry~~ Contact: Battelle - WKR, TLH (Wildlife Int'l analyzing)
- ~~10) Textile chemistry - all other chemistries not covered in #9~~ Contact: Battelle - WKR, TLH (Wildlife Int'l analyzing)
- ~~11) Paper product chemistry (FC-845) MeFOSE, etc.~~ Contact: Battelle - WKR, TLH (Wildlife Int'l analyzing)
- (4)^x 11.5) Vegetation - looking at translocation in various plants - corn, etc. Contact: FACT Team - KJH
- (4)^x 12) New chemistry - new alternatives to PFOS chemistry Contact: Voks/FACT?/KJH
- KRL/HOS (3) 12.5) New chemistry - toxicity in relation to new chemistry in #12 60 day * Contact: Fran/Battelle/FACT?
- LAC (1) 13) New Tox methods - supporting new matrices in current/future tox studies 30 day ongoing Contact: Battelle/Voks/KJH
- SPS (1) 14) New FCF (FC Facilities) methods including effluent, etc. 30 day * Contact: Centre/SPS
- MEE (2) 15) New human methods - char. of individuals Oct. 2-300 Decatur samples to send out. 30 day * Contact: Northwestern - KJH

Companies for outsourcing: Battelle (Ohio), Northwestern Bio Lab (Utah), Voks (Dr. Voyksner, Research Triangle Institute in NC), Wildlife International, Fran (Fraunhofer Institute in Germany), Centre analytical - 3M Building 236, etc.

AUTHOR'S FULL NAME or INITIALS

J. A. Climen

DATE:

9/16/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 9/16/98

Objective:

5 Reference: How to print MSDS from database

PRISM Database

10 PRISM Subsystem - Depends on what is needed. Can get to
PRISM update for MSDS or Query/Report
for the 3M #

#2 Prism Update

#2 Update existing material

Scroll down to material + type in FC, L, or T #
(Select match, find)

DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS

Jim A. Clemens

DATE:

9/16/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

9/16/98

Objective:

5 Reference: FACT Meeting - KIH, SAS, HOS, JT, MEE, KRL, LAC, (+ Grant Paul QAU)

Grant - overview of procedures + changes going on within QAU.

10

Wildlife Int'l - Tech transfer of information possibly have one of us fly there or have them come here.

Northwest Bioanalytical - Here next week for tech transfer & they will be spending time to improve our methods.

15

EFOSE ADME study in Rats → Batelle

Matrices - Whole Blood Validation - finished - IP
 - Urine Validation - Empore method - before Friday 9/18/98
 Plasma

20

Sera Samples - use the crunch std from Ogi.

Automatic dilutor will be arriving soon.

25

Dehmann -

Buffer - 7F sees interference

citrate binds with metal - free fluoride + soluble metal

30

1:1 H₂O - 500 ppm

1:1 TISAB Buffer - 800 ppm

complex ions with metals

10-50 µl may not be representative

35

20X scale-up other FC besides 95 = PFO₂AA, C₆ Homologue, PAAA <5 ppb

Hepatocyte Rat samples - low level of contamination - ABS report ms/ms analysis.

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

9/16/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

9/17/98

Objective:

5 Reference:

1) 7 H. sera samples arrived from 3M medical for extraction + analysis. Also, Jean requested that results be sent directly to her for her to contact the employees.

10

2) 418-008 Sera sample extraction complete + ready for analysis.

3) Protocol for 418-00 was completed.

15

4) Quantitation of Rat Whole Blood validation.

20

25

9/22/98

- Validation need to complete for Whole Blood in order to start milk curd samples for 418-008.

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemes

DATE:

9/17/98 + 9/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 9/22/98

Objective:

5 Reference:

Northwest Lab

Thursday + Friday

General Studies

David
Roger

PFOS analysis

10

- Talk through extractions + analysis
- 2 wks to work on methods

Matrices Bovine Liver
Human Sera

200-1200 in October

Human Sera 2 x 5 mL

- ① faster / more effective ext. method
- ② Validate method
- ③ Open discussion / Partnership

other analytes

POAA, PFOSA, PFOSAA, E+FOSE

20

Agenda

1) Extraction methods Intro to PFOS

solubility

2) Analysis Methods - LC/MS
GC/MS

3) Breakdown / metabolites - scheme + ions relative abundances

25

4) Water extraction discs / Empore C₁₈

FIA

Digestion methods

Characteristics

Std material

30

Glass + solubilities

perchloric Acid digestion

Challenges = 499 - 80 scan for PFOS

SD interferes + adds to the area
count w/o looks more reasonable

35

Contaminated Human Sera
Don't know the source

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 9/22/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

DATE: 9/23/98

1 PROJECT NO.

SUBJECT:

197234

Objective:

5 Reference: FACT Meeting

Kris, Mark E, Joy J, Harold J, Kent L, Kari R, Grant P,

3.1 on 3 m
2.2 Chick

QAU - observing

10

- Chick - hydrolysis Kurt will be the operator - Dennis + Rick Dahl

- Check equipment numbers for each system

15

- EtFOSE + PFOS fed animals
check RT

498 → 78

418-10 +11 +12 to Battelle
settingcheck the protocol to ensure contract
lab was included in text

20

1) Range Finder MeFOSE-OH
- 224PFOS, PFOSA, PFOSAA
Methyl Amide, Acetate, -OH

25

Battelle, Northwestern, GLP
Volkner Research

30

- Rat Chow Reports

35

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 9/23/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

117334

9/30/98

Objective:

5 Reference:

FACT Meeting

- 2 gen studies (Rats)

- acid contents with milk curd

10

- denatured proteins so are using the Nitric Acid extraction procedure

6% goat milk fat

10% rat milk fat

- Fluorochemical metabolite in Human Serum

15

PFOS $\rightarrow$ PFOSAA

2nd most prominent peak (Area)

$$\begin{array}{c} \text{C}_8\text{F}_{17}\text{SO}_2\text{N}^+\text{H} \\ | \\ \text{CH}_2\text{COO}^- \end{array}$$

M556 (Anion)

Shows up in EtFOSF-OH Fed liver + sera - more prevalent in this matrix

20

6 Components are found in H. Sera PFOS, PFHS, POAA, PFOSA, PFOSAA, M556

- Telomar like the int. std $\text{F}_3\text{C}-\text{CF}_2(\text{CF}_2\text{CF}_2)_n-\text{CH}_2-\text{CH}_2-\text{OH}$

Not showing up very well & that is surprising, thought it would show up better

25

Dupont's compound

metabolite of Telomar

$$\text{F}_3\text{C}-\text{CF}_2(\text{CF}_2\text{CF}_2)_{n-1}-\overset{\text{P}}{\underset{\text{O}}{\text{C}}}-\text{O}^-$$
if $n=6 = \text{FC-143}$ $n=8 \quad m/z=513$

Theory - breaks down faster than our fluorochemicals

30

To Do:

① Call Company to get information on bloods samples

② Telomar - find this compound

35

Sera - levels same as workers in plants + pups not doing well, or parents

Liver -

AUTHOR'S FULL NAME or INITIALS

Xia A. Clemens

DATE:

9/30/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

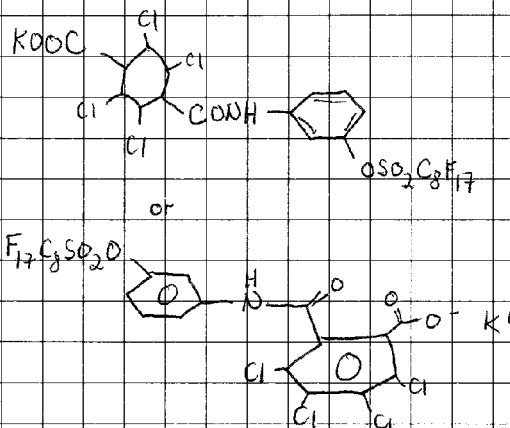
SUBJECT:

DATE: 10/5/98

Objective:

5 Reference:

K Salt Structure FC 228



Study will start 10/12/98 Monday
Non GLP

Liver, Urine, Feces, Serum - systemic - interhepatic 3x 7 than systemic

DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

10/5/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

10/7/98

Objective:

5 Reference:

FACT meeting

Instrumentation/equipment required or needed

+ possibly something for the
96 well extraction when
that gets up and running

10

- Porep already approved

- QTOF

- Dilution

- 5933

- GCA new tech ml/ms pos + neg

- Quatro

DO NOT WRITE IN THIS MARGIN

15

20

25

30

35

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens

DATE: 10/7/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 10/15/98

Objective:

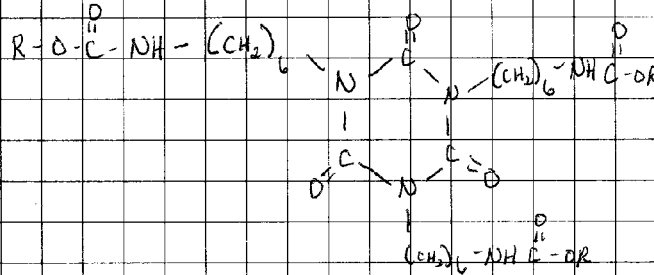
5 Reference:

FACT meeting

Hydrolysis + Instrument justifications

319-1100 ppm
MeFOSE

FC 1395

R = MeFOSE
= ethylene glycol

10

DO NOT WRITE IN THIS MARGIN

15

FC 365

Extraction + Solvent dissolved

ETFOSE

PFOS

IP

2000 ppm

80 ppm

- Sticking to glassware
- Hydrolysis before Acid digestion
- No Hydrolysis

20

MeOH

159 ppm

500 ppm

Acetone

400 ppm

14 ppm

A.D.-1

Ø

50 ppm

25

FC 1367

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

10/15/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 10/21/98

Objective:

5 Reference: FACT meeting

MeFOSE-OH + metabolites
- Same as EtFOSE
- with one unique metabolite

H. Sera has both Et + MeFOSE
metabolites.

10

Food - EtFOSE	90s	Scotchban
Carpet - MeFOSE	60s	Scotchguard

DO NOT WRITE IN THIS MARGIN

15

20

25

30

35

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemens DATE: 10/21/98

WITNESS'S FULL NAME or INITIALS DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 10/28/98

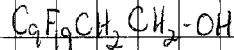
Objective:

5 Reference: FACT Meeting

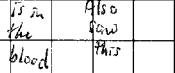
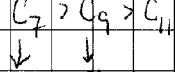
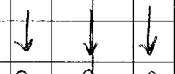
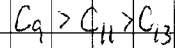
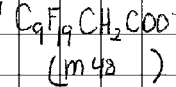
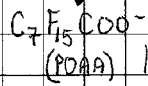
Telemer material found in H. Sera samples (DuPont material)
all straight chain

10

1981 metabolites



Telemer Alcohol



15

Thought material in historical sera was PDAA (thought PFOS)

1981 - from a research paper DuPont stopped making the material to coat carpet

20

3M - eurothane based stable in the Hydrolysis

K-Salt falls apart rapidly & is metabolized rapidly = not a good comp'd to use

DO NOT WRITE IN THIS MARGIN

25

EtFOSSE has a unique metabolite PFOSAA
MeFOSSE " " " " M570

both have
M556, PFOSA, PFOS

M513 from carpet (DuPont)

30

Time line

MeFOSSE-based

EtFOSSE-based

MeFOSSE-based

Scotchgard

Scotchban

Scotchban

1960

1970

1980

1990

post 1960 → M556, ~~PFOSA~~ PFOSA 70s + 80s < 90s conc

pre 1980 → PFOSAA, M570

1998 → PFOS, PFOSA

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

11/04/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

11/04/98

Objective:

5 Reference:

Order of Analysis

Friday → Rat Urine Validation

10

④ Dilutions TOX106 TOX105 - MS, MS-D

⑤ FC-122 Test curves Urine + FC 228 K Salt Urine

③ Argus 009 reext. man livers

① Amelia Scale-up H + A

② Madeline Fish meal

K-Salt $\Rightarrow 7832 + 732$ ions
 $C_8 \quad C_6$

15

11/04/98

20

Food project - monomer diester, 3 Amides, ethyl Fove Chloride

* Disclaimer paragraph for any non-GLP data released from this laboratory

* Reports summarized for release to Dale, Tox, etc

25

* Reports of Human Sera

Animal Sera

Background Sera

} detailing the fingerprints

30

Naive Rat Study Report use as the template Progress Reports -

35

92.5 repeating polymer in (-) for Adipate

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

11/04/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 11/10/98

Objective:

5 Reference: Samples to be sent or are at Battelle for analysis

Fetus + Placenta samples

Try a new extraction procedure

10

① Use 1g of liver sample → 15 mL H₂O remove 5 mL + ext
using reg. ion pair method 2X with MTBE + final volume of 10 mL MeOH

② Also extract with control rat placenta

15

③ ADME monkey - wait for proposal

④ Low Dose PFOS Rat Liver + sera to be sent out to Battelle (PFOS only)
They have a sera validation in place 15ppb Harlan control rats

20

- Liver validation checking to see if it's OK to validate a method for
6 metabolites + EPOSE-OH if only looking for PFOS.

DO NOT WRITE IN THIS MARGIN

25

30

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

11/10/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

117234

DATE 11/10/98

Objective:

5 Reference:

Goal planning - 1999
Protect, enhance, promote

- 10 1c - Increase/Establish protocol for effective communication with outside lab resources
2 - Optimize use of current resources for problem solving
3 - Educated about tech/exp advances available outside our lab
1b - Establish review/QC - checks for work at outside labs
4 - Implementation of lab methods into the field environment (Assist with)
- 15 5 - Continue to provide accurate quantifiable data GLP/non-GLP for FC projects
6 - Continue to develop new methods for the analysis of low level FC, new FC's, & new matrices
7 - Continue to facilitate tech transfer to internal & external labs
8 - Provide analytical expertise/advise/education to customers to facilitate good exp design
- 20 9 - Promote FACT experimental capabilities within the company
D - Continue to Provide leadership in understanding the Corporate Issue

DO NOT WRITE IN THIS MARGIN

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE: 11/11/98

WITNESS'S FULL NAME or INITIALS

(READ AND UNDERSTOOD)

DATE:

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference:

FACT Meeting

Sending out Documents - give to Janine a copy of what was sent and to whom it was sent.

10

Human Sera document report of historical data - sent to Dale + Bill

- can get a copy to review.

AED ~ ppm

ECD = 100 ppb in extract

15

- Scale up extraction Liver + placenta

Drester Curves

105 FC122

① 106 K Salt

107 Low Dose PFOS

} sample receipt

20

PDAA study in Monkeys if looking for PDAA look only

5 more protocols from Andrew sent yesterday.

25

Pebe Ellefson - Talk on glucuronides

Pharm. + metabolism of Fluorochemicals

In vitro prior to animal TOX studies to determine stability

Biotransformation - same as metabolism

30

Xenobiotics - absorbed across lung or skin or ingested compounds in food.

Renal excretion - critical role in termination of biological activity poisoning polar char

35

some may be lipophilic + remain unionized

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

11/11/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

117234

DATE:

11/11/98

Objective:

5 Reference:

Cont from page 58

most biotransformations take place between point of origin + renal elimination

10

phase I parent → more polar introduce or unmask (-OH, OH₂, SH)

phase II parent or metabolite → diff. polarity highly polar conjugate

* glucuronic acid most prevalent

sulfuric acid, acetic acid, or amino acid

15

will need to get conjugated then eliminated because of the EC structure.

Could be protein bound, enterohepatic recirculation, etc.

When do biotransformations occur - liver, lung, kidney, skin, GI tract

20

Mixed Function Oxidase (MFO) System

many enzymes in the lipophilic membrane of ER of the liver.

25

need to extract prior to analysis

+ remove conjugate

hydrolysis/enzyme → β-glucuronidase

to remove glucuronic acid with extraction

Method for extraction

0.2M Sodium Acetate NaOAc

5mg B-Gluc / 0.5mL NaOAc

30

Hydrolysis
SPE prep
11/11/98

1.0mL urine

order today
(6mL cartridges)more dilute, better it will
flow through

1.0mL NaOAc (0.2M) pH 4.6

0.5mL NaOAc / B-Gluc

2.5mL incubated overnight @ 37°C (or 2-3 hrs) test this

35

Prior to SPE adjust pH, centrifuge

(can lyse w/ ACN then centrifuge + ext.
supernatant)

then run through the 6cc empore cartridge

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

11/11/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 11/16/98

Objective:

5 Reference: Brainstorming on Human Sera / Environmental effect, fate

Set up our experiments to determine fate + environmental fate

10

1) Defining/Refining metabolic fingerprints

ethyl FOSE, methyl FOSE

monocenter, dimer

isodipate

me FOSE based

Rats - fed with high doses of adipate, polyparathene, etc. allopate
see if there are ratio specific fingerprints or distribution differences

15

2) Track fingerprints in Human Sera after determined in the rats

- receive 5ml from Decatur plant workers

3) Biosphere contamination

20

4) 50:50 Me FOSE: Et FOSE feeding study to determine if the two compounds can be separated.

25

a) Analysis of sewage (raw + treated) + from any location if Scotchguard/ban in primary source.

- Animals upstream + downstream from plants (secondary)

Bird/livers - some blanks + hits, no definite location geographically.

Cows

Fish

30

Low level water

Dose of sample

Air analysis

Reports

35

* FC-228

- Argus

- Covance

Distributed to various people list in the report

AUTHOR'S FULL NAME or INITIALS Lisa A. Clement

DATE: 11/16/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

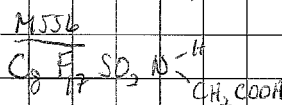
997234 DATE: 11/18/98

Objective:

5 Reference:

FACT Meeting

Friday meeting with Wegner, Sanders, lawyer, MSDS coordinator, etc.
 M556 is an important fingerprint.
 ↳ common to Et + MeFOSE primary

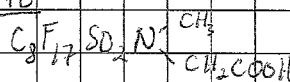


off
 PFOS all converted
 PFOSAA Et
 M556 Et + Me
 M570 Me

10

M570 methyl FOSE common

M570



Dec. 14 - EPA meeting / Wegner
 Dec. FDA meeting / Wegner

Human Stuff
 Food Stuff

human - primary source
 Animal - secondary source

15

Experiments to work on until EPA + FDA meetings to Prepare Wegner

Wed.

Semi-quantitative screen of worker sera

20

Look for extracts
 X - existing extracts M556, M570, PFOSAA, PFOS, PFOSA metabolites
 X - historical extracts g/L numbers from Kris to find
 X - historical samples (archived)

Response factor PFOSAA $\leftrightarrow$ M556

Sera - May also contain Dupont material metabolites

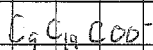
25

Web
 Round
 next curve -
 ext curve - liver
 ext curve - sera

(Packed)
 of a lot were already analyzed
 TAS-A-2037 sent 11/18/98

30

Confirm M513



W * 10ml aliquot to Ch U. to analyze by total F⁻

Retention Time ($\pm 2\%$)

Daughter Ion Ratios 169/219/269

Free F⁻

* Compile pooled sera data

Similar to table with H + A sera info

35

Rat + Human Hepatocytes A screening prior to animal study
 EtFOSE-OH, monoester, PFOS, Ethyl Amide

2m/2F

Analyze High Dose Animals + look for metabolites (qualitative) EtFOSE / monoester / Diester / MeFOSE Rats

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemen

DATE:

11/18/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 11/30/98

Objective:

5 Reference:

FACT Meeting

- Lakes around Battelle - ZDD ppt (after testing)
- Blood extractions, analysis, TOF methods, Dohmann 60% accounted for now would like ~ 90%.
- Dr. V. for 69 ppb, we can account for ~ 40 ppb
Acidify then extract with ether

15

12/3/98

New extraction procedure / changes to old + remix changes

20

Before starting the validations test curves from 1 ppb - 1000 ppb will need to be prepared and analyzed to check the efficiency.
A total of 4 curves 2 in each matrix (Liver, Sera) following the procedure changes and using the new mixes.

Validations Rabbit, Rat, Bovine, Monkey

Liver

1. PFOS, PFOSA, PFOSAA, PFOSEA, M556, EtFOSE-OH
2. POAA, M570, MeFOSE-OH, PFHS

Sera

1. PFOS, PFOSA, PFOSAA, PFOSEA, M556, EtFOSE-OH
2. POAA, M570, MeFOSE-OH, PFHS

A. Mix 1 and 2 will contain the compounds specified; new mixes may need to be prepared.

B. M570, PFHS(C6F13SO3), and monkey sera have not been received yet, please start with Mix 1 for the liver validations after the results from the test curves are reviewed.

Lisa A. Clemm
12/04/98

30

Extraction procedure changes

1. MTBE will be used as the extraction solvent dispensed using the new dispensers.
2. After centrifuging and before removing solvent put samples into an ACETONE/DRY ICE bath to freeze aqueous then pour off all 5 mL of MTBE. Need to test how long to keep in the bath.
3. Evaporate to dryness and reconstitute with 1.0 mL of MeOH.

35

These extraction and analysis methods will be given new FACT numbers. Please talk with Kari or Grant to assign new numbers.

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemm

DATE:

11/30/98 + 12/03/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

113234 DATE 12/04/98

Objective:

5 Reference: Battelle visit info

* Automation of Dilutions for single sample check with Dan H + order today

Journals

10

Biochemistry

Analytical Chemistry

ASMS

CA Selects - all journals combined

DO NOT WRITE IN THIS MARGIN

15

- Careful with data release

20

- Food prep + GPC handouts from LAP

- Overview of Total Sulfonate Method Development MEE

25

30

35

AUTHOR'S FULL NAME or INITIALS

Ann A. Clemen

DATE:

12/04/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

NOTEBOOK NO.

1 PROJECT NO.

SUBJECT:

DATE:

Objective:

5 Reference:

Argus Studies + Covance Studies

Sponsors Marr Case + Andrew Seacat

10

Summary Report #1 PFOS - reprod study TOX012 Argus 418-008

#2 EtFOSE - teratology study TOX098 Covance

(low priority)

15

- validation of Sera + Liver with MIBE - Monday ADME

#3 wk 14 Liver Covance 6329-312 TOX001

#4 FX 3539 waiting for samples

#5 K-Dalt Liver + Sera

20

#6 N-MeFOSE Validation 1) PFOS / PFOSA / PROSEA / PFOSAA / EtFOSE / M556
2) PFHS / M570 / MeFOSE / POAA

DO NOT WRITE IN THIS MARGIN

30

35

AUTHOR'S FULL NAME or INITIALS Chin A. ClemenDATE: 10/02/03

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

Objective:

5 Reference:

Low level serum samples

Approximately 1g

PFOSA

* PFOSAA

* M556 113047-80

EAFOS-0H

PFOSGA

MSDS

purity info

* ship extra for Marcia

Call David Vollmer

Order parts for total SO₂⁻

EX 3539

KJH 27 protocol

This week or next week

Argus summaries - some errors, need to correct them

Lab * Long term studies in-house Fatty Acid Binding Protein

Protocol - Total organic Fluoride

L-15468

cleaned ~2g

Malcolm Burke / Dan Hakes

3-0257

20% Liver

5% Serum

15% Carcass

Total Fluoride

AUTHOR'S FULL NAME or INITIALS

Jim A. Clemens

DATE:

10/08/03

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 12/14/98

Objective:

5 Reference:

Soxhlet Extraction

Tissues/Feces/Fish

10

- 15-20g of tissue
- 5x weight sodium sulfate (granular)
- 300 mL MeCl_2 + 100 mL Hexane
- Put on then let run for 16 hrs or so

15

GPC

Use to remove fats/lipids

20

Florisil

To remove fat

20g Florisil removes up to 1g fat

25

80% Acetonitrile / 20% H_2O
 MeCl_2 more polar

100 mL flush through

30

Collect $\rightarrow$ sep funnel with 100 mL H_2O (Hexane washed or Milli Q)
100 mL Hexane
 $\rightarrow$ Nonpolar

Solvents can be adjusted depending on compounds to extract.

35

AUTHOR'S FULL NAME or INITIALS

Lisa A. Clemens

DATE:

12/14/98

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 01/06/99

Objective:

5 Reference: FACT Meeting

Ext. of fish (minnows) - 2 top priorities closed with E-FOSE

Needs

- 10 1) Compound specific analysis
2) Total Fluorine analysis (organic) a) guts + perchloric acid to release free fluoride + read with the meter

EPA lab in Duluth - Fish

Extraction procedures for different matrices - milk

- placenta

- fish file, guts, heads, etc

- when freezing, make sure to keep it frozen before adding the solvents shake longer than usual - 1 hr not as vigorous

1) SPE

2) GPC

3) Liquid nitrogen - freeze

4) sonicating - foams up fat

5) microwave dig

Note: Samples containing high Deter numbers - E-FOSE-OH numbers not reliable.

AUTHOR'S FULL NAME or INITIALS Lisa A. Clemen

DATE: 01/06/99

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

Late
Entry
on 01/15/99

Objective:

5 Reference:

- Sodium Biphenyl + Acid extraction of serum

- With Ion Pair - the acids extract OK
any other FC need to ext using the Sodium Biphenyl method.143 COO⁻ attaches to protein + ion pair displaces this bond
albumin + FeHAlcohols + amines use the acid extraction instead of the
ion pair method.

To Do:

- 3 Lots of Human Serum + try
- 1) Ion Pair
- 2) Acid Digestion HCl or Perchloric^{ether}
- 3) Sodium Biphenyl

Spike with FC-Mix standard @ 50 + 500 ppb

Using Sodium Biphenyl method extract as follows:

- 1) Ext. to step 5 → Dohrmann for burning
- 2) Completion → Dohrmann using electrode
- 3) Completion → LC-ES/MS ion specific analysis

LAC 01/15/99

AUTHOR'S FULL NAME or INITIALS Jim A. ClemenDATE: 01/15/99

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 01/15/99

Objective:

5 Reference: FACT Meeting

General Laboratory

- FC monitoring (IH) we will be taking over the analytical testing
Bill electrospray, Dührmann, total organic => center analytical will test

10

Hydrolysis, photolysis, biodegradation of surfactants (new + current)
Tom wildlife Springborne = well be providing QC review

- Our Fluorochemical Projects

Monkey ADME Liver, sera, kidney
Bile, feces, urine

15

- Toxicology

Batelle

Fraunhofer

Northwest

PACE Tier 2

Henion

20

- Facilities Center Analytical

- New environmental samples

25

Batelle - ppt in H₂O, FC surfactants starting a good method
development

Henion - Low level in H₂O

Soil + sediment methods by Feb 12th need to be underway

30

Total sulphonate method

Sarah - 20% of her time

Joe + Bob - GPC

Jan - Facilities

35

AUTHOR'S FULL NAME or INITIALS Lise A. Clemens

DATE: 01/17/99

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 01/20/99

Objective:

5 Reference: FACT Meeting

+ Marcia testing different extraction procedures
 + Surrogate + Int. Std will start adding surrogate + looking at Int. Std
 order dusterated compounds - carboxylic acids - octanoic
 straight chain nonanoic

10

Dupont - M513, L63, PFCA Perfluoro carboxylic acids

PBAF there

M513 there mainly in human - 500 ppt.

M613 some samples

15

Rats

M556

POSE

EX-845

} Liver

Sera for the FC-228/K-Salt

20

* Telomar-fed animals - call Andrew to ask where + when samples were done
 and where they might be

25

David Vollmer - interferences with PBAF + Internal Standard

GPC -

30

Feb 4th - KSH gone - business

* Journals

Annually receive information on 5 different journals
 to keep current on new methods, procedures, applications,
 instrumentation, etc

35

AUTHOR'S FULL NAME or INITIALS Lisa A. Clement

DATE: 01/20/99

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

1/22/99

Objective:

5 Reference: Tox meeting - Kris, Mark, myself

Argus 012	Rabbit Teratology	Liver, Sera, Placenta, Fetus
013	PK Rat	Liver, Sera, Urine, Placenta, Amniotic Fluid,
014	X fostering Rat	Liver, Sera, Milk Curd, Pup Liver
015	PK Recovery Rat	Liver, Sera, Urine, Feces

10

6 month PFOS, Monkey: Liver + Sera

4 non-GLP (various): Liver, Sera, Urine, Feces

15

In-Vitro

Telomer (NoTox)	Liver, Sera, Urine, Feces
ADME Monkey	Liver, Sera Urine, Feces, Bile, Kidney

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Battelle

- * 6 analyte in Liver (in progress)
- * 1 analyte in Sera
- * 6 analyte in Sera (in progress)

25

Battelle:

placenta + fetus, Liver, Sera

ABS:

Feces, Urine, Milk Curd

ABS, Inc (Ithica) Henion

Feces, urine, milk curd

30

Fraunhofer

ADME

Fraunhofer

ADME

PACE

Sera, possibly Liver

35

PACE - Per Study

Sera Validation Rats + Rabbits

- * Cross Fostering (Argus 014)

Amniotic Fluid possibly

FACT

Non-GLP, PFOS 6-month, in-vitro

PFOS, PFOSA, PFOSAA, M556, M570, (ETADSE, M2F0SE) PF05EA

AUTHOR'S FULL NAME or INITIALS

John A. Stevenson

DATE:

10/08/03

WITNESS'S FULL NAME or INITIALS

DATE:

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE: 2/22/99

Objective:

5 Reference:

300-500 Human Sera Samples Decatur/ Japan GENDOO6

1. mssb/msto with a rabbit curve

2. Use Dodecyl sulfate or other ⁽⁴²⁷⁾ as surrogate 500ppb - 1.0mL

10 3. For double check standards use Human Serum → evaluate PFOS, PFOA, PFOSAA, POAA, PFHS, mssb, msto vs Rabbit curve

- Buy extra Rabbit + Human Serum for this study

ms18, ms63, mb63, m463 - All Dupont or not? C₄C₇ C₇ 1% of PFOS

DO NOT WRITE IN THIS MARGIN

15

- Repts- analysis - values derived then construct a std curve on top of the endogenous level

- Reconst. in mobile phase 2mM + 4mM while analyzing

- LOQ 5ppb determine it for each run.

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- ADME Studies

- MeFOSE similar to EtFOSE + now starting MeFOSE studies

- Need a validation

2/24/99

25

Paul Lieder + Georgy Olsen Austin 150m + 150F for blood work

Check protocol- 029 + Serum validation 10% C₇ currently in blood

30

3/03/99

35

AUTHOR'S FULL NAME or INITIALS Jim A. StevensonDATE: 10/08/03

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

NOTEBOOK NO.

117234 73

DATE: 2/22/99

1 PROJECT NO.

SUBJECT:

Objective:

5 Reference:

To: Dale Bacon and Bill Reagen
From: K. Hansen, L. Clemen, M. Ellefson

January 22, 1998

Proposed Utilization of Outside Resources to Support Tox Studies:**Battelle:**

Argus 012 (placenta, fetus, liver)
Argus 013 (placenta, liver)
Argus 014 (liver)
Argus 015 (liver)

*liver validation in progress, sera validation complete, placenta/fetus validation planned

ABS, Inc:

Argus 015 (feces, urine)
Argus 013 (urine)
Argus 014 (milk curd)
Argus 009 (milk curd)

*will require 4 rat validations

Fraunhofer:

ADME

*will require 4 validations

PACE:

Argus 014 (sera)
Others, if appropriate

*will require 1 validation (rat, cross into rabbit)

**suggest negotiating a "per study" fee instead of complete use of the facility until competence is proven

FACT:

TOX030-6 Mo. PFOS in Monkey
4 * new, non-GLP projects
In-vitro study
Telomer feeding study
Method development amniotic fluid and mammary tissue

Although most of the studies currently awaiting analysis are PFOS, we will request validation for all EtFOSE analytes in anticipation of using these resources for future studies.

AUTHOR'S FULL NAME or INITIALS Olivia A. StevensonDATE: 10/08/03

WITNESS'S FULL NAME or INITIALS _____

DATE: _____

(READ AND UNDERSTOOD)

1 PROJECT NO.

SUBJECT:

DATE:

Objective:

5 Reference:

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15

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25

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DO NOT WRITE IN THIS MARGIN

No further entries

AUTHOR'S FULL NAME or INITIALS _____ DATE: _____

WITNESS'S FULL NAME or INITIALS _____ DATE: _____

(READ AND UNDERSTOOD)