Environmental Research - Nisbet

Nisbet - Production
Accidental Release
Other Releases

Transport in environment
Air
Water
Solution
Sediment
Dredging
Dumping at Sea
Disposal from ship

Could not account for more than a small amount of material produced
Could not account for more than a small amount of material going into water
Concluded that <4 Cl was being degraded

Sim Question
What happens to Cl dibenzofurans?
Are PCBs going to stay in dumps & land fills?
Are PCBs in sediments going to be sequestered?
Is it correct that lower Cl pcbs are degraded?
What is human exposure?
What would be effect of curtailment of sales?

MONS 057484

National Pesticide Monitoring Program

Kutz Skin, Digestion, Respiration
National Human Monitoring Program

Found 5, 6, 7 Cl ϕ_n Thumbs 1254 + 1260
Lower confounds are metabolized

Human milk in Ark + Miss - all samples contain "traces"

Grant Canadian population averages 1-2 ppm [illegible]
fatty tissues. Somewhat lower in Alberta + [illegible]

Jelinek Foods or Animals Foods contaminated with [illegible]
15 → 8.7 ug/day Total diet Young male
9.5 → 8.7 Fish + meat

Blackwood Maritime fish are low
Snat lakes fish higher

Walker Very poor

Wolford

MONS 057485

Rutty - Air
Ethylene glycol impinger collection

100 ngm/cu meter - 1254

Dennis

.01 - .05 ug/l Water
.25 217 Sediment

Soils .01 to .05 ppm - dry wt [illegible]

Small percentage of soil samples are p[illegible]

McDermott 1242 + 1254
100,000 concentration factor

Munson
(Wisting House)

Risebrough Nesbit + Serafin

0.1 ppt in Pacific coast water

MONS 057486

[illegible]	Solubility ppb	Partition Coeff	actual/vetr
Tri	16	7,[illegible]	
Tetra	16	8,[illegible]	
Penta	19	16,[illegible]	
DDE	1.3	14,[illegible]	

2,4,5	2'5'	penta
2,4	2'4'	tetra
2,4	2'	tri

Nisbet

1975 model consistent with 1972

Inconsistencies

200 ppt in [illegible]

100 ngm/cu m in air

200 - 2000 ngm/m² fallout/day

1000 tons/yr - dry fallout

2000 tons/yr - rain

Axial release & transport is larger than can be accounted for by model

MONS 057487

1) What happens to chlorofurans in environment
Formed in environment?
Not retained in bodies of birds
Are " in human tissue
2) What happens to PCB in dump?
Not significant amount coming out.

3) Are PCBs in sediment going to be covered as
Hint that that they are going to recycle
in shallow water.

4) Don't correct that 4 and lower are se...
degraded
Are significantly degraded but
not as rapidly as we would like
Humans do not retain 4Cl material

5) What is the human exposure?
Tissue monitoring - PCB in human fat
Food - most in fish
Average exposure is meaningless concept!
Diet 9 ngm/day } average
5 ngm/day }
300 ngm/day for sport fishermen
Exposure for breast fed babies much
greater than adult
3-4 ngm/kg/day

MONS 057488

6) What would be the effect of Monsanto curtailment
Decrease in many areas
None in Lake Michigan

1) Not all the closed system uses are closed
2) Large backlog of products containing PCBs still in use
3) Environmental Inertia

Should not have hoped for rapid change

Longest time lag in human tissue

MONS 057489

Mount — Effects of pollutants on aquatic organisms
Warning provided by effect on aquatic organisms
Aquatic organisms concentrate up the food chain

Walker

Stendell

Hansen

Nebeker

Bend — Lobster + Dog Fish — 2,4,5, 2',4' junta
½ life 2.5 days

MONS 057490

Muir – Identify problems before marketing!

Rollins

Fire resistance

Reliability – 1957 incident – fluid quality
1963 reduced size

Usage – 70,000 lbs/day

Effluent – .0170 or 7 lbs/day effluent

Mac Arthur

76 months total for a phase out.
38 months for publication of rules
38 " for a phase out

.5 million lbs of use in investment casting waxes

Brunson Dow – McGraw XFS1469XL
Butylated monochloro-dephenyl oxide
1) tan δ – both paper film + all film
2) DIV – higher than 1016
3) System size – same as 1016
4) Fire hazard – low. 154°F 161 174 [illegible]
5) Capacitor reliability – 3 yrs of life test
18,000,000 capacitor hours [illegible]

Price will be "reasonable"
1 M lbs/yr – 1976

MONS 057491

6) Biodegradability – better than 1016
Bioconcentration – low compared to 1016
Toxicity acute + 90 day low

Fish toxicity - moderate 15 0.76 Aroclor

Montgomery 1 the technology to produce a silicone material has been developed.
No environmental problems known
D.C. has commercial production to handle world transformers

Non P.C.B. Replacement { Gas Cooled
Silicone Q21090 FEI meeting in Boston
Dry type

Q21090 - dimethyl silicone specially formulated

30 years of experience

Silicone fluids have high flash point

Has been rated by U L - low classification

Fault cleared after 4½ u

F.I.A., F.M. MONS 057492

Should be in evolutionary program - 3-5 yrs.

Silicones - food uses

Toxicity - very thoroughly investigated

No bio accumulation

Silicones - don't biodegrade
do chemically degrade
depolymerize in soil + water

Silicones do cost more
Entire cap. + trans. market
9.2 M/yr of PCB fluids
25. M/yr for Silicone

PCB transformers now in use can be
changed over to Silicone

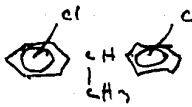
300 M lbs of PCBs now in use

Not recommending change in present transformer
Would result in more hazard than
continuing use

Wood -

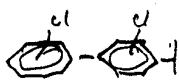
Coquais - PCB used in transformers only under fire hazard exposed

Transformers
Tri + TCB
Tri + TTCB



flash 190°C
Fire 250°C DK = 5.4

2, 3, 2', 3' 8.3



chloralkylene 12

2 times less toxic than 3 Cl

cost 2X 3 Cl - raise cap cost 10%

MONS 057494

(Murry) 8 experiments
Dale Haddad TCB in Heat exchange
" Hydraulics $10 M/gr annual + casualties

PCB as dye solvent for carbonless carbon paper
Trade secrecy covers possible

PCBs in paint
Chlorinated paraffins ok substitute

Short fishing loss from PCB?

Inckalik DINDP - limited use
ENJ 2065 K = 4 dec at R.T.
branched C_9 alcohols
Contaminants
Alcohol +
Water

Packed bed of Attapulgus Clay for purification
Epoxides are beneficial

MONS 057495