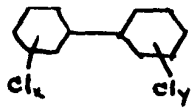
6/11/79

Bill Papageorge presentation on PCBs N-118

In summary, PCBs was always a people problem.



x & y - from 0 to 5

209 isomers

1st known commercial manufacture - Swann Chemical Co in 1929, Anniston, Ala. Was asked by Westinghouse to make chloro-diphenyls.

There were no patents on PCBs. M ended up as sole manufacturer.

Raw materials - benzene & chlorine

Normally sold in bulk - trucks, tank cars, drums & some 5-gal. cans

Commercial properties (became env. problems)

- dielectric
- solubility
- fire resistant
- stable
- didn't react → inert

Uses

Dielectric
- transformers, capacitors, switch gear, electromagnets

Plasticizer – rubber chemical
Coatings - swimming pool paints; traffic lane paints
Adhesives
Hydraulic fluids
Heat transfer fluids
Sealants - caulking
carbonless paper (really scattered PCBs throughout environment)
wax extender
pesticide extender (was used to try to control Dutch elm moth)

Tradenames

Aroclor 1221, 1232, 1242, 1248, 1254, 1260, 1268, 1016 (last 2 digits denote chlorine %) Only 1268 a solid

Pydraul
Therminol FR } Heat transfer fluids
Santotherm FR }
1016 (modified 1242 with more persistent isomers removed)
Pyranol - Gen Elec trademark
Inerteen – Westinghouse trademark
Santovac – used in vacuum pumps

Environmental Presence

We were making 80 M lbs/yr.

1967 - Univ. of Stockholm studies - looking for DDT
pine needles, eagle feathers, children's hair, fish
1969 - pelicans reportedly not reproducing properly
in so. Calif.; Berkley did studies
1970 - N. Sea storm beached birds & seals - PCBs
found in them

Later determined that pelicans had DDT. N. Sea
incident → PCBs ~~didn't~~ weren't as concentrated as
first thought

Food chain presence

MONS 011145

1968 - Yusho, Japan → PCBs contaminated rice oil
Some serious health problems. Oil had 2,000 ppm
Fish meal contaminated by PCBs (fish meal from Peru)
Ended up in chicken feed & thus to chickens.
Recycled paper - 1971 - recycled grayboard studies
(Shredded wheat contained PCBs). Biggest source
was recycled carbonless copy paper
Dairy products - Dairy silos from Mich to Ala, Ill
to Pa. area was served by one
silo manufacturer who had his own "recipe"
for coatings - "recipe" contained PCBs, which
were 1st found in milk in Michigan
Fish

PCBs found in env. samples (pelicans, etc.) always said to be Arochlor 1254. Much of M's actions in early days focused on removing higher-chlorine isomers & retaining lower-chlorinated ones

Monsanto program

- Analytical methodology (1967-68)
- Animal studies (studies of were done for food chemical but not for industrical chemicals). Two-yr. studies begun on dogs & rats,
- Starting informing customers (particularly about Arochlor 1254, since all the reports focused on it.
- Manufacturing environmental control
- Sales withdrawal
    - June 1970 - heat transfer in food use
    - August 1970 - plasticizers (coatings, caulking, adhesives etc)
    - April 1971 - copy paper
    - April 1971 - hydraulic fluids
    - December 1971 - heat transfer - industrial
    - October 1977 - all others
- Incinerator installed at Krummrich for convenience of customers. Huge financial costs.

PCB Mink Case – federal court in N.H.

Plaintiffs: 3 mink ranch operators
Allegation: PCBs in mink diet reduced reproduction resulting in loss of current crop & breeding herd.
Defendants: Duck farmer
Poultry feed supplier
Bakery meal supplier
Monsanto

Said Monsanto made PCBs, ended up in bakery meal, which was processed into poultry feed & fed to ducks. Duck entrails fed to mink as delicacy

Judge – wanted new law made in court
Jury – young man, 2 retirees, 2 workers, 2 ladies (one was wife of local Pepsi Cola bottler)

Trial lasted 6 weeks. Jury decided that producer of poultry feed was 75% responsible, Monsanto 25% responsible. Award was about $1 million.

Monsanto's PCB actions
- we did well, but we didn't move fast enough
- we didn't communicate to the mink journals

PCB Mink Case

Impact of literature – plaintiff's lawyer focused on old product literature; 2 letters: one was from mktg. mgr. that announced no longer available (but had papers showing we did make shipment after June 30), one was announcement of alternative fluid (mentioned "as soon as current inventory depleted.")

Role of quality control - reason why poultry feed supplier got 75% of responsibility - also because of supplier's unusual business practices (like keeping of diaries & missing records)

Limitations of jury - testimony got very technical & very specialized. After 6 weeks, in Papageorge's opinion, jury was so confused with facts that jury became subjective

Case was not appealed.

We've studied PCBs extensively, as have others, & never found dioxins.

PBBs more active toxicologically than PCBs

PCBs bioaccumulate