

PCBs MINI SYMPOSIUM ISSUES

Session No.	Session Topic and Issues	Authors	Discussants
I	Analytical Methodologies - o Current threshold concentrations for identification of PCBs in the environment using various analytical methodologies - o Current threshold concentration for identification of polychlorinated dibenzofurans (contaminants of PCBs) - o Need, if any, for standardized sampling procedures to reduce inter-laboratory variability in PCB residue analysis - o Identification and measurements of PCBs formed in process streams - o Discussion period	Dr. Edo D. Pellizzari	Dr. Mary S. Wolff
II	Exposure Studies--Environmental Residues and Bioaccumulation A. Environmental Residues 1. Quantity of PCBs released to environment per year from "totally enclosed systems" and other sources 2. Quantity of PCBs released from leaking condensers and transformers 3. Quantity of PCBs released through disposal processes - o Efficiency of high temperature PCB disposal - o Efficiency of PCB disposal in industrial boilers and impact of disposal in wider areas 4. Dispersal pathways of PCB following environmental release - o Effect of release concentrations of PCBs in Great Lakes, in other open "PCB hot spots" for next 10, 20, 30 years - o Impact of anticipated release on PCB concentrations in edible fish from these waters 5. Populations specifically exposed and exposure trends - o Recent data concerning concentrations and stability of PCBs in various ecological environments, and the decay half-lives of these systems	Dr. Brock Neely	Dr. Mark Melancon

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Session No.	Session Topic and Issues	Authors	Discussants
	- o Background levels of PCBs in the atmospheric, terrestrial and aquatic compartments of the environment - o Average residence times for PCBs in the three environmental compartments or, conversely, the degradation rates in air, water and soil - o Assuming no further release of PCBs, anticipated decay rate in food supplies, background levels and human tissue		
	6. Comparison of expected field levels of PCBs to effect levels in mammals		
	7. Probability of PCB transformer/condensor fires forming TCVDs and PCDFs; impact of seed fires		
B.	Bioaccumulation	Dr. Mary Jo Vodick	Dr. Mark Melancon
	1. Bioaccumulation rates of PCBs in fish, wildlife and humans		
	2. Excretion rates of PCBs in fish, wildlife and humans		
	3. Impact of PCB bioaccumulation in plants		
	4. General description of biotransformation patterns		
	5. Likelihood of acute lethality resulting from food chain accumulation of PCBs in aquatic environment		
	6. Likelihood of acute lethality resulting from food chain accumulation of PCBs in terrestrial animals		
	7. Recent data on bioaccumulation and persistence of PCBs in food chain		
C.	Discussion period		
III	Exposure Studies--Industrial Processes	Dr. Kent Hodges	Dr. Robert Kaley
	- o Estimation of PCBs incidentally formed in various process streams - o Worker exposure streams - o Potential for environmental release - o Relative importance of release compared to existing environmental pools of PCB - o Discussion period		
IV	Health Effects--Epidemiology	Dr. William R. Gaffey	Dr. Renate Kimbrough
	o Studies of sports-fishermen in Michigan who have consumed high concentrations of PCBs in contaminated fish		

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Session Topic and Issues

Authors

Discussants

- o Study on Michigan farmers exposed to PCBs from silos coated with PCBs
- o Recent reviews of "Yusho incident"
- o Other incidents involving PCB exposure
- o Recent studies on PCBs in human tissues
- o Half-lives of PCBs in humans
- o Discussion Period

V Health Effects--Laboratory Studies

A. Reproductive Effects

1. Relevance of studies on reproductive effects in Rhesus monkeys (Allent et al.) for humans
2. Other recent studies demonstrating reproductive effects
 - o Dosage levels
 - o Species
 - o Types of abnormalities
 - o Incidence
 - o Types of abnormalities
 - o Incidence
 - o Severity
 - o Number of effect levels
 - o Significance levels for parameters
3. Significance of animal reproductive studies and conclusions about potential effects of PCBs on human reproduction

B. Carcinogenicity

1. Recent studies on carcinogenicity of PCBs
 - o Dose-response relationships over time
 - o Statistical significance
2. Consensus of scientific opinion on carcinogenicity of PCBs in animals and humans
 - o PCBs as "initiators" or "promoters"
 - o Mode of action for reported carcinogenic effect (and specifically arene oxide formation)
3. Significance of animal studies to human population

C. Mutagenic Effects

1. Recent studies on mutagenicity of PCBs
 - o Mutation frequencies
 - o Statistical significance
 - o Proposed mechanisms of action and evaluation of their appropriateness
 - o Sensitivity of test method

Dr. Seymour Friess
Dr. Stephen Safe

Dr. Renate Kimbrough

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	2. Conclusions - o Mutagenic potential of PCBs - o Significance of animal data to human population		
	D. Other Health Effects 1. Placental transfer rates 2. Rate of entrance of PCBs into human breast 3. Potential target organs in humans - o Neuroendocrine effects on thyroid, adrenals, gonads and hypothalamic-pituitary axis hepatotoxicity - o Others 4. Dermal and inhalation absorption rates in humans 5. Significance of observed persistent chloracne and skin pigmentation changes 6. Relevance for humans of studies by Allen et al. in demonstrating learning disabilities in Rhesus monkeys and low PCB dosages 7. Evidence of detrimental effects on learning in species other than monkeys 8. Other health effects observed for PCBs - o Effect - o Species - o Dose - o Statistical significance		
	E. Discussion period		
VI	Environmental Effects A. Recent studies on ecotoxicity of PCBs in various fish and wildlife species 1. Reported effects 2. LD50s 3. Statistical significance B. Impact of impaired reproduction on phytoplankton, daphnid and fish populations 1. Potential for population changes 2. Potential for community disruption C. Reproductive impairment in exposed birds 1. Residues in bird eggs 2. Behavioral alterations 3. Relative contributions to impaired reproduction	Dr. Richard Hunter	Dr. Mark Melancon

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Session No.	Session Topic and Issues	Authors	Discussants
	D. Relative sensitivity of mammals to reproductive and lethal effects of PCBs 1. Mink 2. Felines 3. Primates 4. Rodents 5. Others E. Modes and rates of absorption for fish and wildlife F. Comparison of field concentrations of PCBs and reported effect levels for reproductive and other chronic effects in fish, birds and mammals of economic importance 1. Water, sediment and food chain concentrations 2. Modification of PCBs' toxicity by metabolism in mammals or fish G. Significance of mutagenic effects studies in animals on fish and wildlife population H. Significance of carcinogenic effects studies in animals on fish and wildlife population I. Discussion period		
VII	Risk Assessment - o Health and environmental implications of current environmental and human tissue concentrations of PCBs - o Relationship of environmental and human tissue concentrations of PCBs to exposure - o Possible environmental concerns for safety of monochlorinated biphenyls and other low chlorinated isomers - o Impact of analytical uncertainties for PCB residue analyses on risk assessments - o Potential synergistic activity of PCBs with other chemical groups, and estimates of numbers of chemicals in each group for which synergism may exist - o Concern for increased susceptibility to disease in populations of animals after PCB exposure - o Discussion period	Dr. Robert James	Dr. Roy Harbison