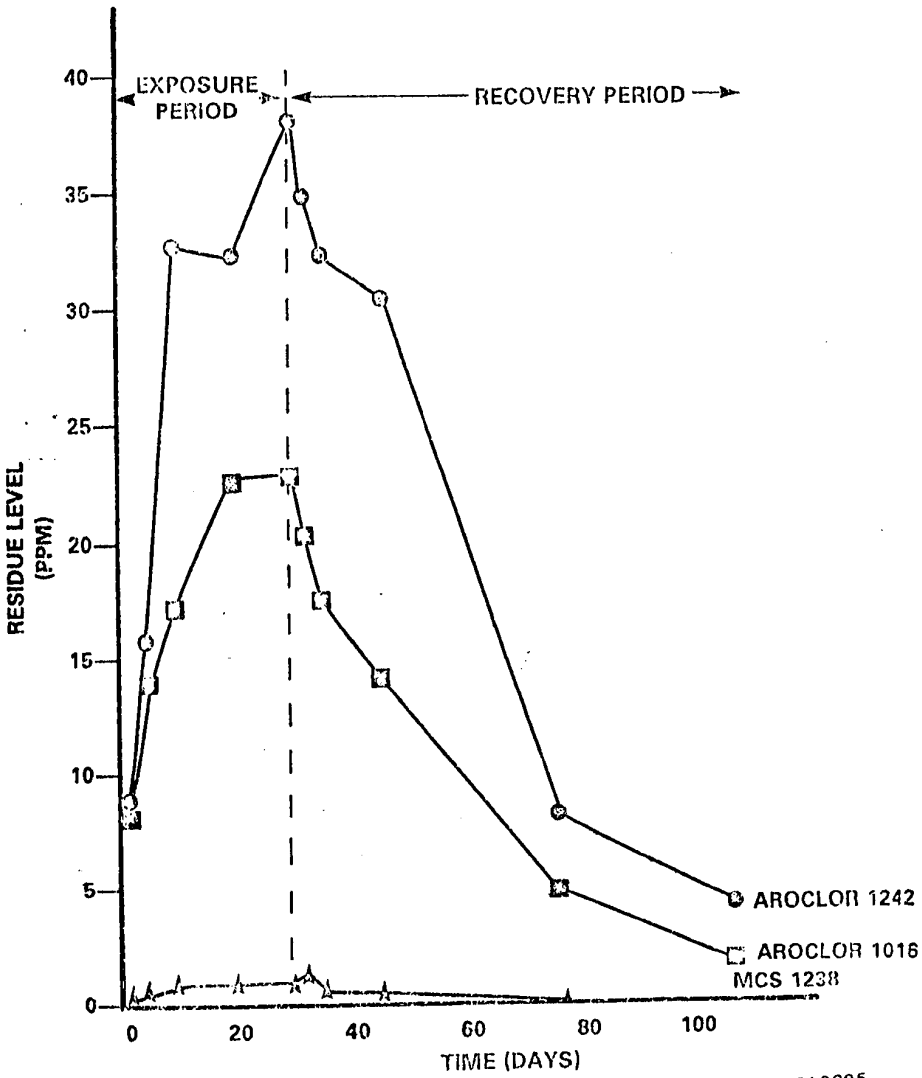
BIOACCUMULATION IN MAMMALS (RATS)

- 25 PPM DIELECTRIC FLUID IN DIET
- 30 DAY EXPOSURE, 75 DAY RECOVERY
- FAT SAMPLES COMPOSITED PERIODICALLY
- EXTRACTED, ISOLATED AND ANALYZED

MONS 048904

FAT TISSUE RESIDUE LEVEL VS. TIME

25 PPM FEED LEVEL FOR RATS



MONS 048905

DIELECTRIC FLUID ACCUMULATION FACTORS

FLUID	ACCUMULATION FACTOR*
MCS 1238	0.04
AROCLOR 1016	0.9
AROCLOR 1242	1.4

*ACCUMULATION FACTOR = (TISSUE CONCENTRATION/ FEED CONCENTRATION) AFTER 30 DAYS

MONS 049906

BIOCONCENTRATION POTENTIAL

- EQUILIBRATE FLUID BETWEEN WATER AND 1-OCTANOL
- DETERMINE CONCENTRATION IN EACH PHASE
- CALCULATE PARTITION COEFFICIENT (C_o/C_w)
- ESTIMATE BIOCONCENTRATION FACTOR

MONS 048907

PARTITION COEFFICIENTS (LOGARITHMS)

PRODUCT	LITERATURE	CALCULATED	EXPERIMENTAL
BIPHENYL	4.1		4.1
DIPHENYL SULFONE	2.4		2.5
ISOPROPYL BIPHENYL		5.6	5.5
TOLYLXYLYL SULFONE		4.1	3.9
MCS 1238		4.7	4.5

MONS 048908

BIOCONCENTRATION FACTORS (BF)

LOG (BF) = 0.54 LOG (P) + 0.12

PRODUCT	LOG P	BF
BIPHENYL	4.1	200
ISOPROPYL BIPHENYL	5.5	1200
TOLYLXYLYL SULFONE	3.9	160
MCS 1238	4.5	400
TRICHLOROBIPHENYL	6.2*	3200
TETRACHLOROBIPHENYL	6.9*	6300

*CALCULATED

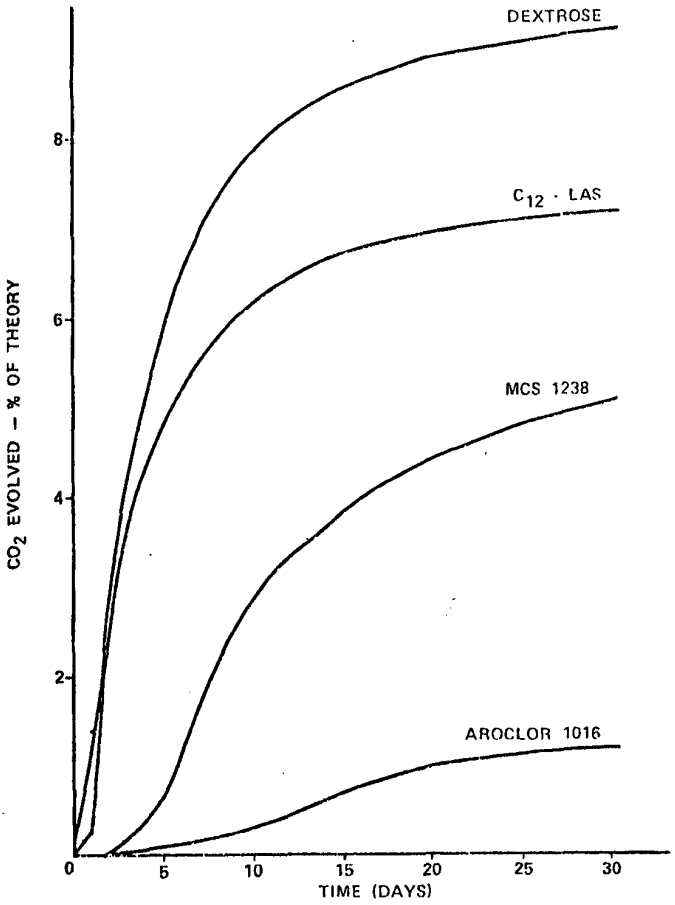
MONS 060840

BIODEGRADATION

- MICROBIAL ORGANISMS – NATURALLY OCCURRING
- ULTIMATE – $CO_2.H_2O$, INORGANIC SALTS
- PRIMARY – DISAPPEARANCE OF TEST MATERIAL

MONS 048910

ULTIMATE BIODEGRADATION



MONS 048911

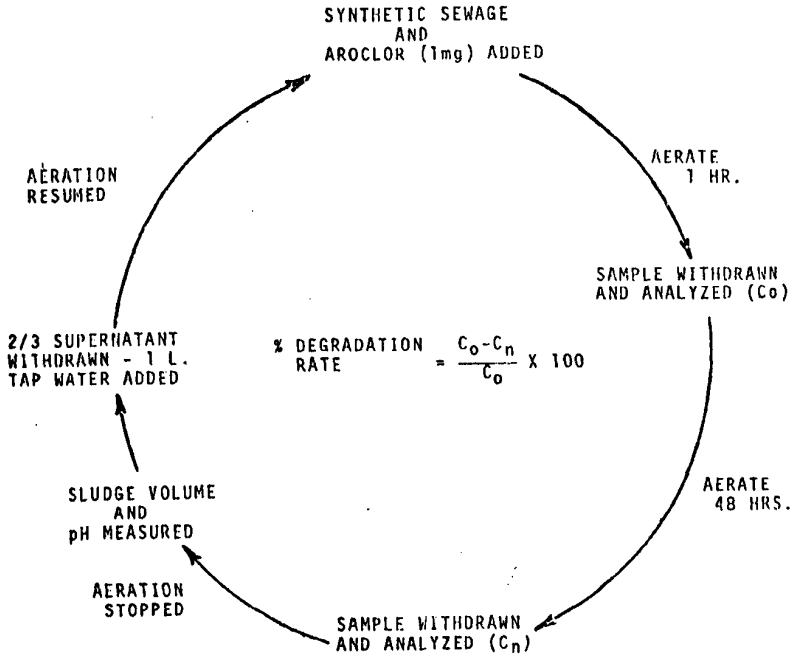
ULTIMATE BIODEGRADABILITY

CO_2 EVOLVED IN 35 DAYS

PRODUCT	PER CENT OF THEORY
MCS 1238	52
AROCLOR 1016	11
DEXTROSE	80-90
C_{12} LINEAR ALKYLBENZENE SULFONATE	60-80

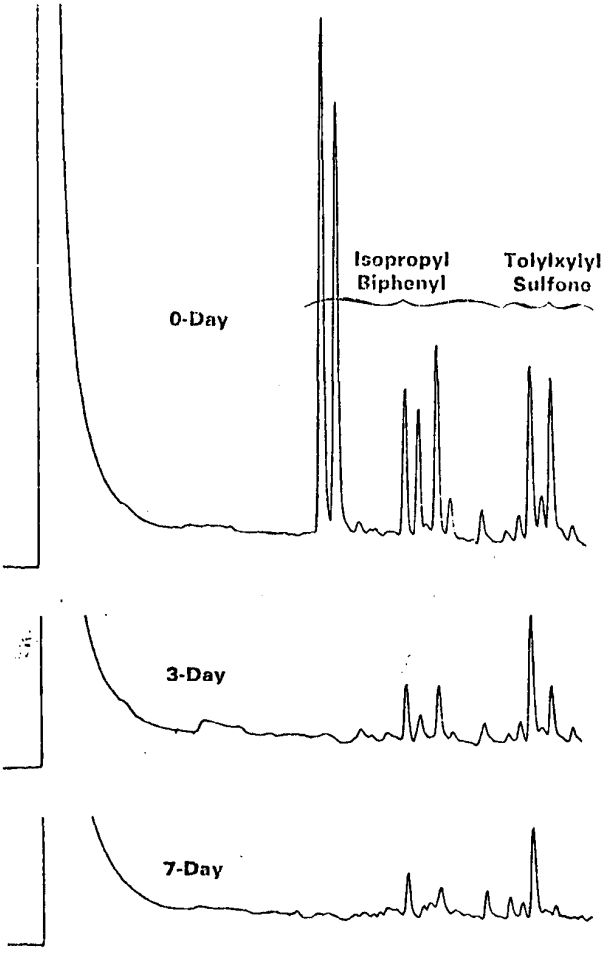
MONS 048912

MECHANICAL CYCLE



MONS 048913

PRIMARY BIODEGRADATION OF MCS 1238



MONS 048914

PRIMARY BIODEGRADABILITY

	PER CENT BIODEGRADATION	
	1-DAY	7-DAY
MCS 1238	62	87
ISOPROPYL BIPHENYL	78	95
TOLYLXYLYL SULFONE	32	69

MONS 048915

FUTURE BIOACCUMULATION STUDIES

- C^{14} METABOLISM IN RATS
- C^{14} BIOCONCENTRATION IN FISH

MONS 049916

FUTURE BIODEGRADATION STUDIES

- C^{14} BIODEGRADATION IN SOIL
- C^{14} BIODEGRADATION IN RIVER WATER

MDNS 048917

MCS 1839

STUDIES PLANNED OR IN PROGRESS

ULTIMATE BIODEGRADABILITY

- SOIL
- WATER

PRIMARY BIODEGRADABILITY

- ACTIVATED SLUDGE

MONS 049918

TRICHLOROBENZENE

- LOW ULTIMATE BIODEGRADABILITY

  DETERMINE PRIMARY BIODEGRADABILITY

- HIGH VOLATILITY

  DETERMINE AIR/WATER EQUILIBRIUM

- PHOTOCHEMICAL STABILITY

  DETERMINE PHOTODEGRADATION RATE

MONS 048919