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APPLIED SCIENCES REPORT

ACCUMULATION OF MCS-1560 IN RATS - A 30 DAY TISSUE RESIDUE STUDY

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ACCUMULATION OF MCS-1560 IN RATS - A 30 DAY TISSUE RESIDUE STUDY

INTRODUCTION

A feeding study was carried out to measure the bioaccumulation of MCS-1560 (dichlorodiphenylmethanes) in albino rats. The animals were fed rat chow containing 50 or 500 ppm of MCS-1560. After thirty days the rats were returned to a normal diet. At predetermined intervals, rats were sacrificed and tissues excised and frozen. These tissues were analyzed to provide residue accumulation and depuration profiles.

SUMMARY

Concentrations of MCS-1560 in rat tissues showed negligible bioaccumulation during the 30 day feeding period. Residues were rapidly metabolized and/or excreted when the rats were returned to a basal laboratory diet.

DETAILS

A. Feeding and Sampling

Rat chow containing 50 or 500 ppm MCS-1560 was prepared by mixing the fluid into Ralston Purina rat chow. The treated chow was fed ad libitum to adult albino rats for an exposure period of 30 days. Following the 30-day exposure period, all remaining rats were placed on the basal laboratory diet. At predetermined intervals during the exposure and recovery periods, five rats from each exposed set and a control set were sacrificed. Fat, liver, and muscle tissues were excised and composited for each group. Samples were quick-frozen and stored in glass containers with aluminum foil-lined caps to minimize risk of contamination.

B. Isolation

The MCS-1560 residues were isolated from the tissues by solvent extraction. A weighed amount of the fat (or liver) was placed in an Erlenmeyer flask and homogenized three times with 25 ml of pesticide grade hexane and anhydrous sodium sulfate using an ultrasonic homogenizer. The combined supernatants and washings were filtered through anhydrous sodium sulfate and diluted to 100 ml with hexane.

C. Clean-up and Measurement

Sample clean-up consisted of separation of the MCS-1560 from the lipid by deactivated alumina adsorption chromatography. The column eluent was collected in a Kuderna-Danish evaporative concentrator and concentrated to 5 ml. This concentrate was transferred to a micro Kuderna-Danish evaporative concentrator and concentrated to 0.5 ml. The residue levels in the extracts were measured by liquid chromatography (LC) using a variable wavelength ultraviolet detector. The LC conditions and calculations are reported in method PC-76-M-22.

A statistical evaluation of the data indicated that the 95% confidence limits for individual results were 57 to 175% of the amount present.

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D. Discussion

An accumulation factor, defined as the concentration in the tissue divided by the concentration in the feed was 0.02 at the 30 day feeding point. This value compares with accumulation factors of about 1 for the PCBs.

TABLE I

MCS-1560 - 30 DAY RAT TISSUE STUDY

	Day No.							
	2	5	10	20	30	32	35	45
MCS-1560 (ppm) found in Fat tissue								
50 ppm feed level	0.6	1.0	1.0	1.3	2.7	0.3	0.3	N.D. <0.2
500 ppm feed level	8.6	4.2	13.0	6.2	11.7	4.9	1.4	N.D. <0.2

N.D. - None detected, less than values calculated based on background.

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2/77 - O. Hicks, W. J. Litschgi, J. P. Mieure

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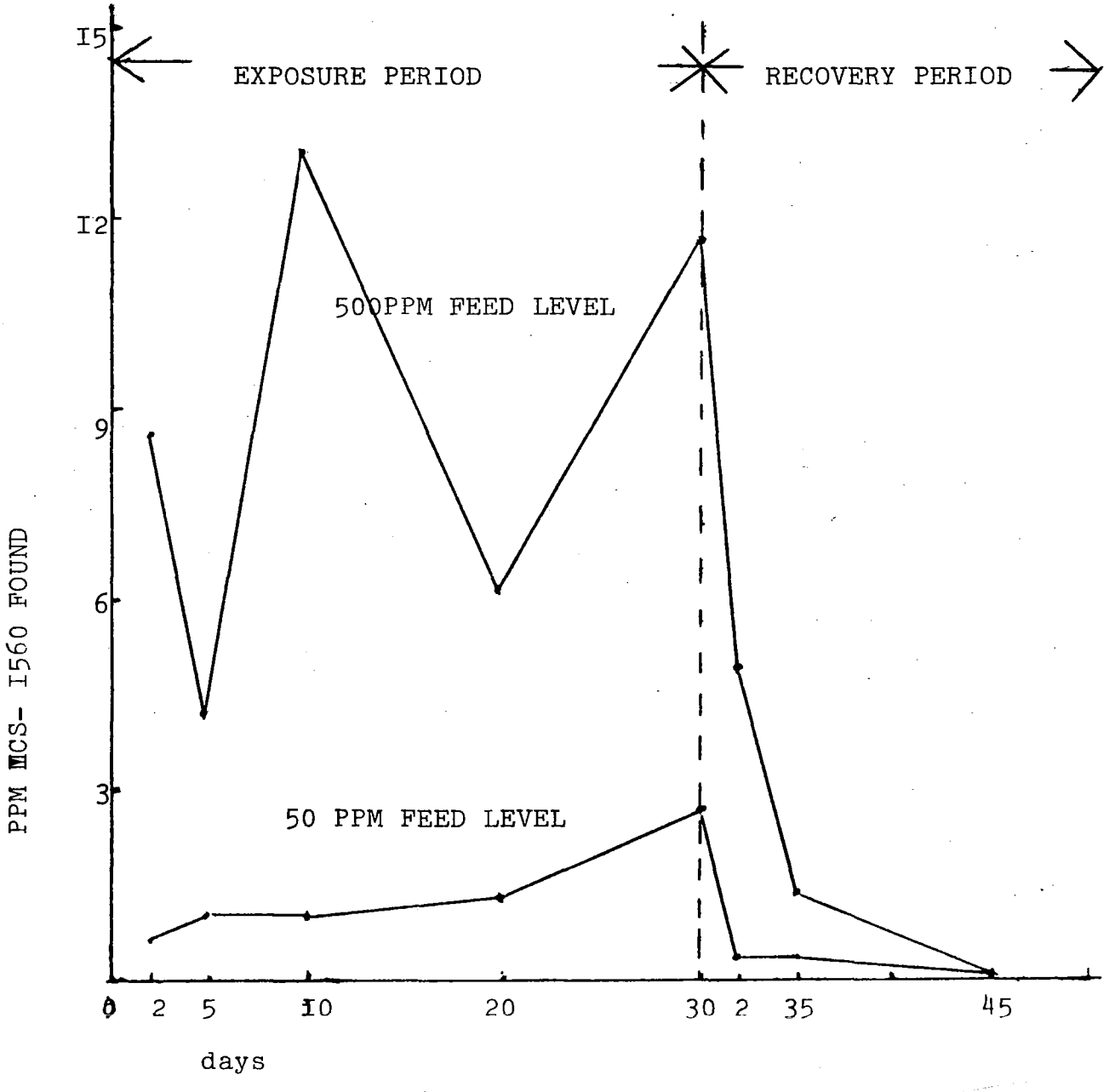
FAT TISSUE RESIDUE LEVEL VS. TIME - MCS - I560

50AND 500 PPM FEED LEVEL FOR RATS



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