Monsanto Industrial
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APPLIED SCIENCES REPORT

BIOACCUMULATION OF CHLORODIPHENYLMETHANES IN RATS- PILOT STUDIES

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BIOACCUMULATION OF CHLORODIPHENYLMETHANES IN RATS- PILOT STUDIES

OBJECTIVE

To determine the level of bioaccumulation of selected chlorodiphenylmethanes in white rat tissues using liquid chromatography.

SUMMARY

Pilot feeding studies using three chlorodiphenylmethanes (MCS-1558, MCS-1560 and MCS-1826) at three feeding levels (25, 100 and 500 ppm) were conducted for 14 days. Excised fat tissue composites from five rats were then analyzed for the products.

CONCENTRATION FOUND IN 14 DAY SACRIFICE (PPM)

Feed Level	MCS-1558	MCS-1560	MCS-1826
25	0.5	0.9	0.5
100	3.2	4.0	1.9
500	5.9	34	9.1

MCS-1558 and MCS-1560 show an altered pattern in the rat tissues indicating selective concentration and/or depletion of some isomers.

These data were used to establish appropriate feeding levels for the 30 day bioaccumulation/depletion study. Feeding levels of 50 and 500 ppm were selected with an 11/8/76 starting date.

TEST METHODS

1. Extraction and Clean-up.

Ten g. portions of fat were homogenized three times with hexane/sodium sulfate to extract the lipid, using a Polytron tissue homogenizer. Sodium sulfate was added to absorb moisture. An aliquot was then transferred onto a deactivated alumina adsorptoin column and eluted with a 10% (V/V) methylene chloride/hexane mixture. This mixture was concentrated to ~0.5 ml and analyzed by liquid chromatography (LC).

2. Liquid Chromatography Measurement.

MCS-1558, 1560 and 1826 were separated from residual lipid by reverse phase liquid chromatography. A Waters Associates Liquid Chromatograph and a 4.0 mm ID X 30 cm μBondapak C_{18} column (Waters Cat No. 27324) was used for the analysis. Detection was by UV using a Schoeffel SF 770 set at 215 nm. The LC conditions were as follows:

Eluent: 60 parts acetonitrile and 40 parts 0.01 M H_3PO_4
Flow Rate: 1.5 ml/min.
Mode: isocratic

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Quantitation of residual product in the fat tissue was achieved using external standards of known concentrations. A calibration curve of the sum of the peak heights vs. concentration was prepared. Details, including recovery data, are contained in Physical Chemistry Method No. 76-22.

MCS-1809 and MCS-1775 can also be measured using this method with a modification in the eluent.

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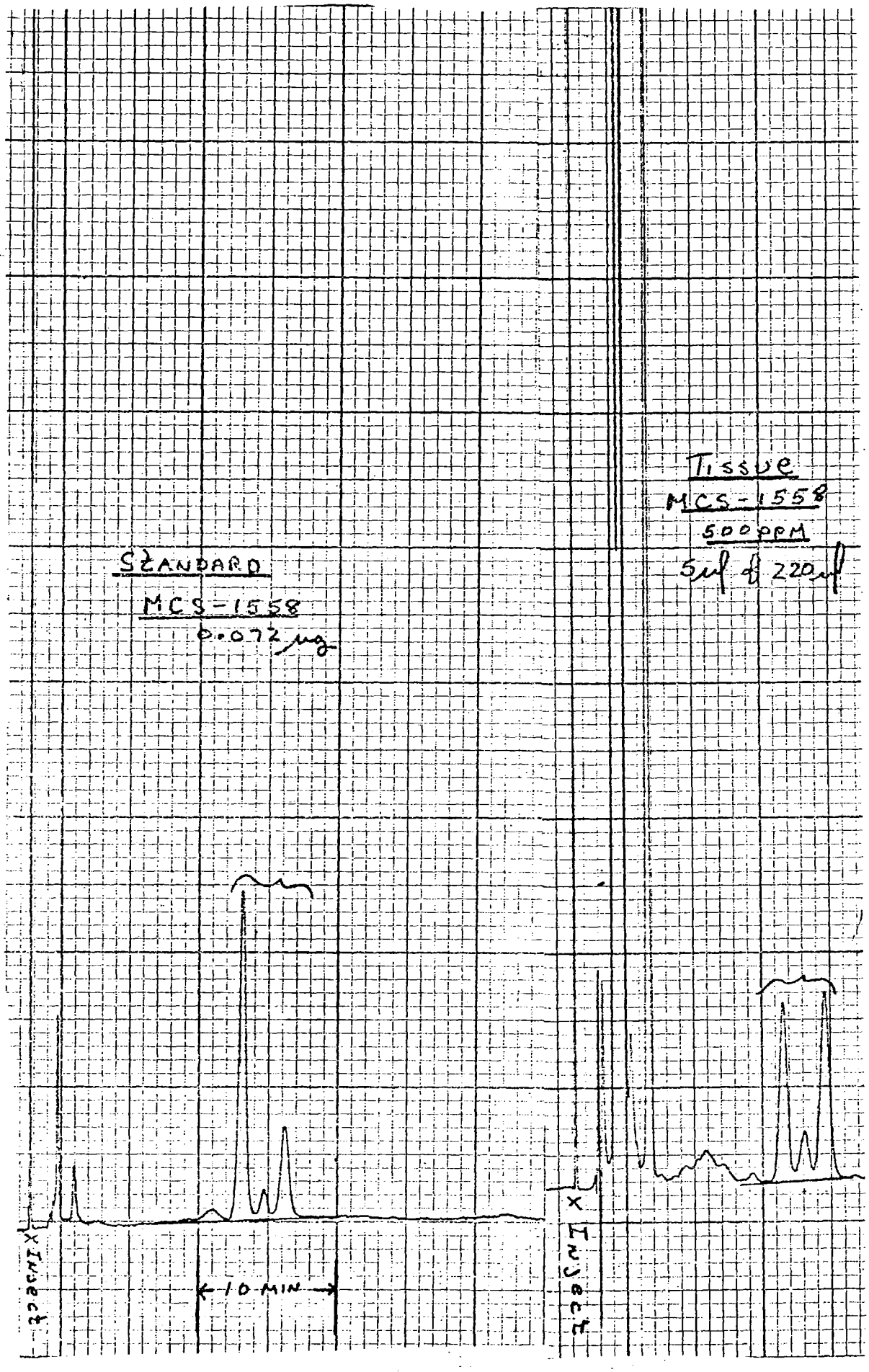

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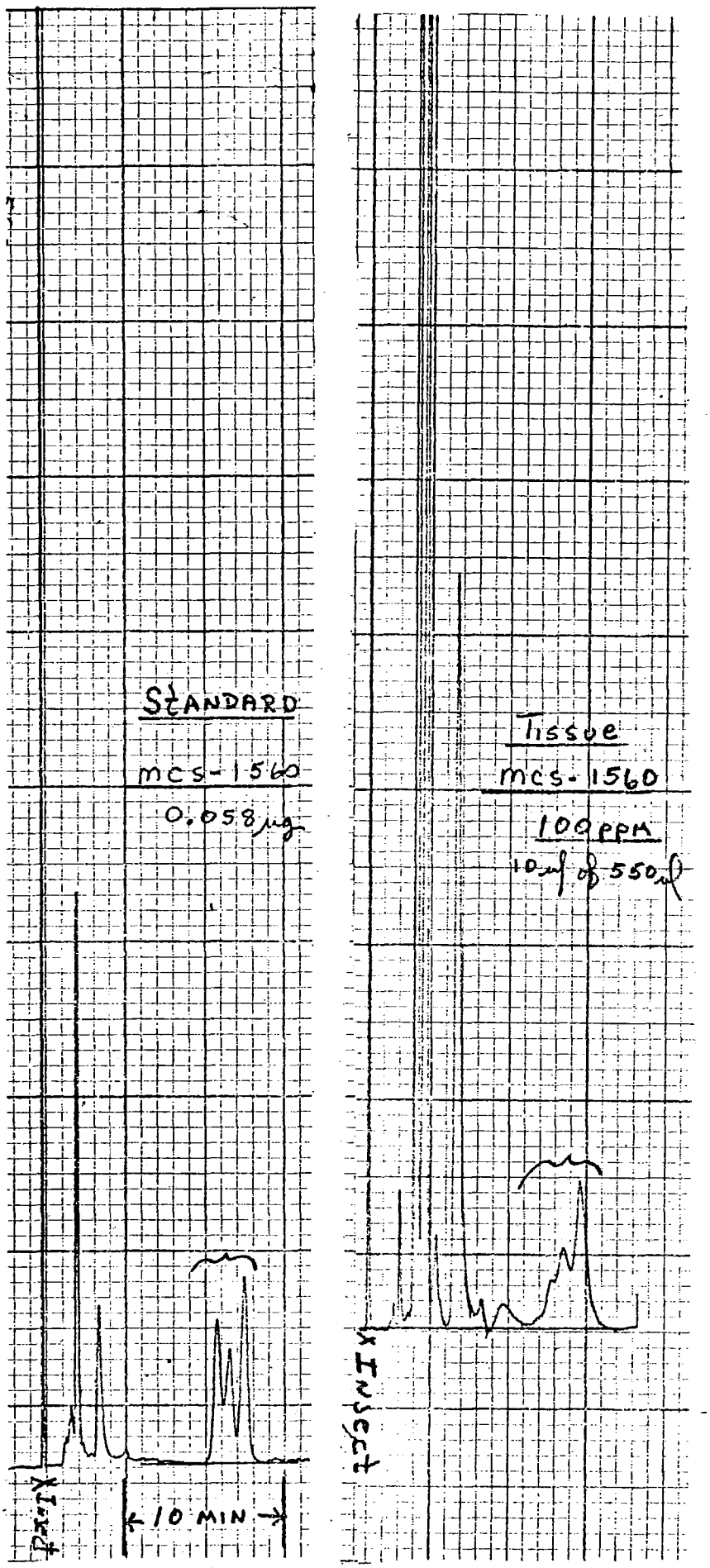
STANDARD
mcs-1560
0.058 µg
10 MIN
INJECT
tissue
mcs-1560
100 PPM
10 µl of 550 µl

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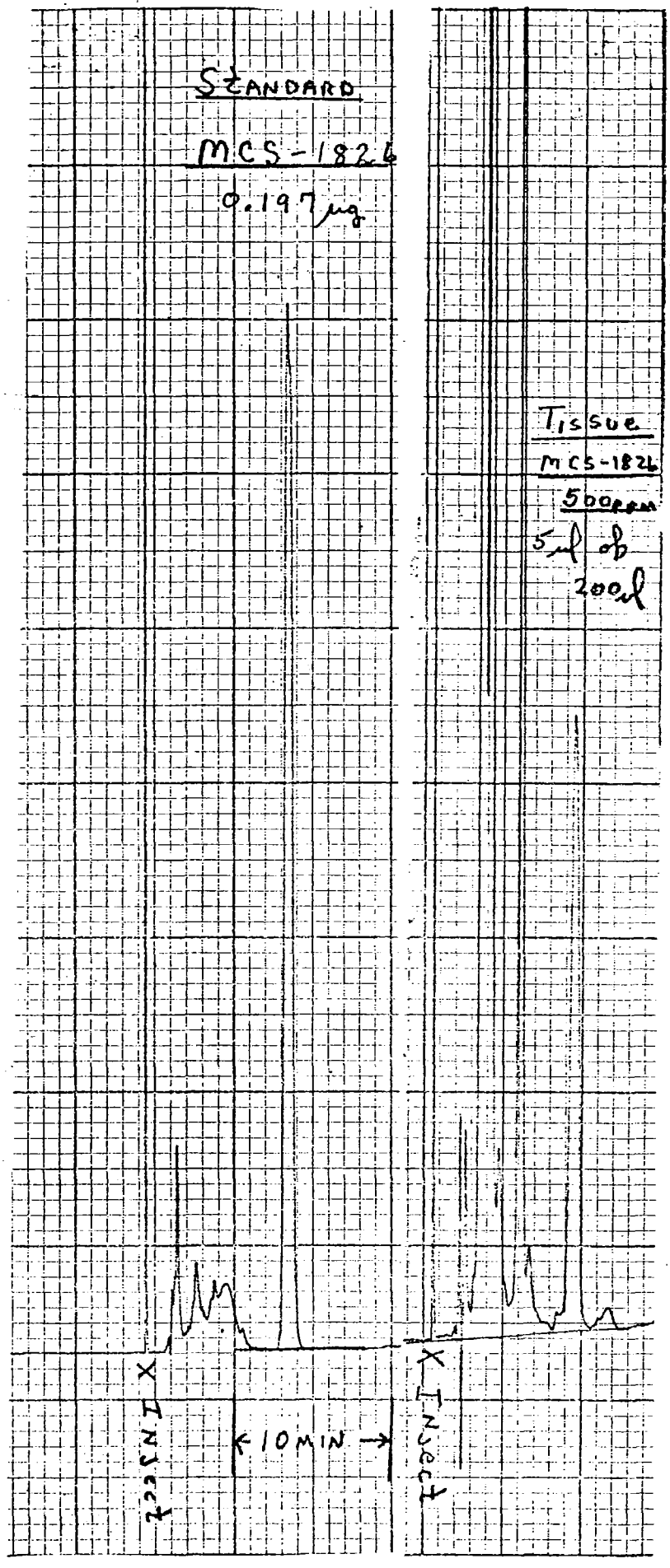

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