PESTICIDE ANALYSIS

PRESENCE OF POLYCHLORINATED BIPHENYLS AT RESIDUE ANALYSIS OF BIOLOGICAL SAMPLES.

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(Synopsis)
At analysis of samples from the Swedish wild-life fauna by means of gas chromatography, using both electron capture detector and micro coulometric detector, a large number of unknown but chlorine containing compound have been detected together with the ordinary pesticides. Massspectra of some of these compounds obtained at a combined gas chromatograph mass spectrometer (LKB-9000) indicate that most of the unknown compounds are polychlorinated biphenyls, potentiated somewhat in nature towards those of higher degree of chlorination.

A large number of samples have been examined, and polychlorinated biphenyl are found especially in fish and in sea birds but also in needles of conifers and in some samples of human depot fat. Two hundred samples of soil and water did not contain detectable amounts of chlorinated biphenyls nor did twenty samples of terrestrial mammals.

By the use of a nitration method most of the ordinary pesticides can be removed from extracts, leaving the polychlorinated biphenyl unaffected. Using this method, it has been shown that two of the major peaks of the chlorinated biphenyls overlap the two peaks of pp'DDT and op'DDT respectively. This is found true for SF-96 columns, most frequently used for the quantitative residue analyses reported in literature; not in case of QF-1 columns.

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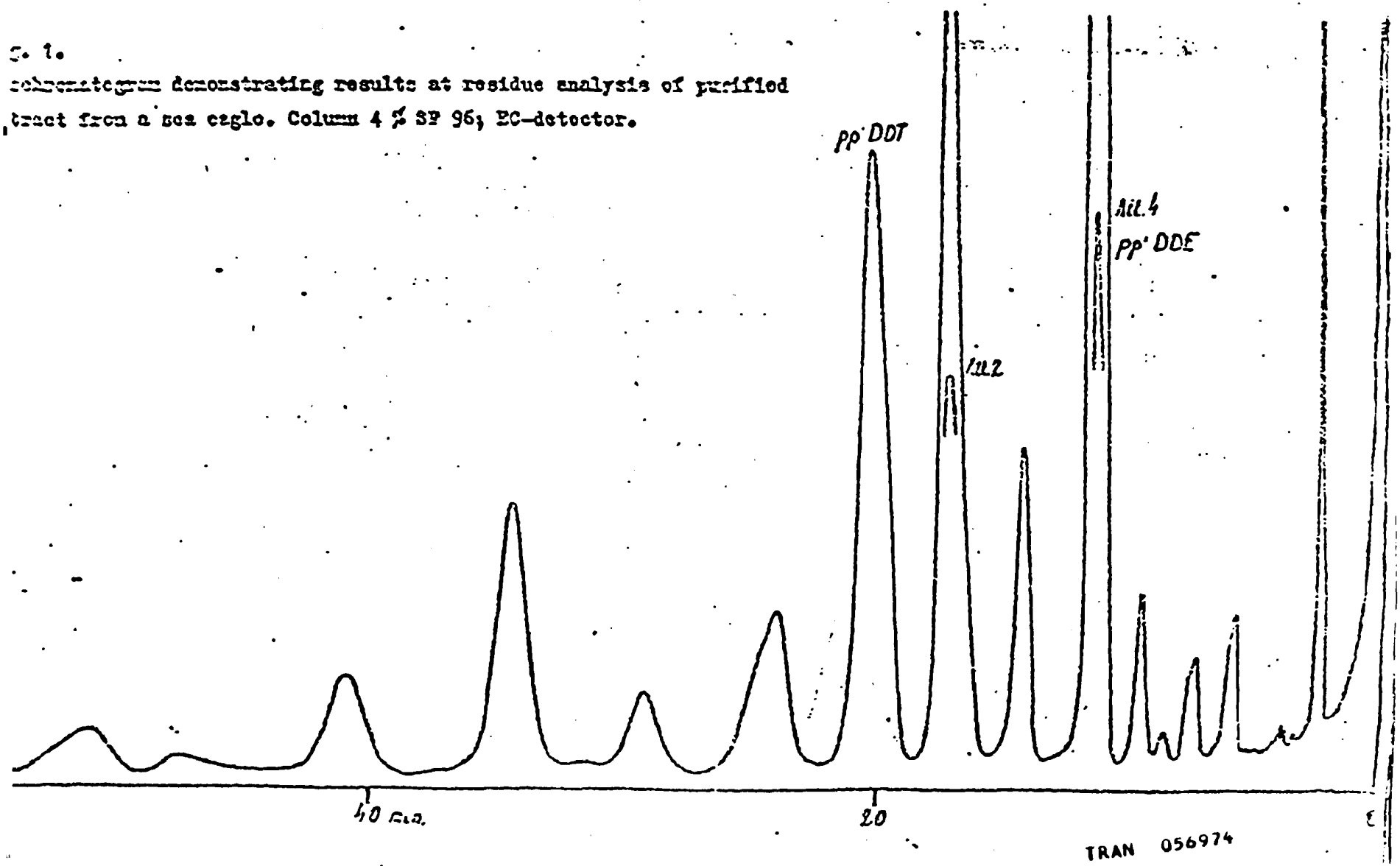
Fig. 1.
Chromatogram demonstrating results at residue analysis of purified extract from a sea eagle. Column 4 % SP 96; EC-detector.



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Institute of Analytical Chemistry
University of Stockholm
Roslagsvägen 90
STOCKHOLM 50

Head: Gunnar Widmark, Ph.D.

Secretary: Mrs. Ingrid Broms

Research fellows: 15

Education: 24 students a year
12 graduates

Technical assistants: 4

Workshop: 2

Laboratory area: about 400 m^2

Instrumentation (examples): Gas Chromatographs (40 of different manufacture), IR (Perkin-Elmer 421), UV (Hitachi 139), atomic absorption (Jarrell-Ash), differential scanning calorimeter (Perkin-Elmer DSC-1) ion chamber (Cary), electrophoreses, zone-melting, mass spectrometer LKB-9000

Research specialities: Analytical chemistry in the fields of organic chemistry, biochemistry and medicine ("life sciences")

Basic Research:

Gas chromatography, general	(Allan Linnarson)
Analysis of expired air	(Bo Jansson)
Head space analysis	(Bengt Larsson)
Quantitative gas chromatography	(Kerstin Widmark)

Applied Research:

x Analysis of chlorinated pesticides	(Sören Jensen)
x Analysis of 3,4-Benzopyrene	(Lars-Erik Strömberg)
x Lipid analysis	(Kerstin Widmark)
Mercury analysis, atomic absorption	(Jan Åsbrink)
Organic mercury, gas chromatography	(Sören Jensen)
Isotopic synthesis	(Olof Borgå)

x = research combined with stations for routine analysis

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