# HEXACHLORONAPHTHALENES IN HALOWAX 1014 AND IN BIOLOGICAL SAMPLES

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## INTRODUCTION

Polychlorinated naphthalenes (PCN) have been used as technical products in the electrical industry because of their heat and chemical stability (1).

Only a limited number of PCN congeners have been detected in environmental samples. One of the dominating congeners, a hexachloronaphthalene, is present in levels comparable with those of the coplanar PCBs (2).

Asplund et al. (3) have reported on one of the components in a commercial PCN mixture, Halowax 1014, to be strongly retained in rat adipose tissue and liver. The component, identified by GC-MS as a hexachloronaphthalene, has the same GC retention time as the major hexachloronaphthalene isomer found in environmental samples.

In the present study this hexachloronaphthalene component and its retention in rat have been further investigated.

## RESULTS

Halowax 1014

Using a PYE (2-(1-pyrenyl)ethyldimethylsilyl) column and HPLC the most bioaccumulating hexachloronaphthalene component in Halowax 1014 has been shown to consist of two isomers (Fig 1A). Analysis of liver extracts from rat after clean up according to Asplund et al. (3) show that both isomers are strongly retained (Fig 1B). No successful separation of the two hexachloronaphthalene isomers by GC has yet been performed.

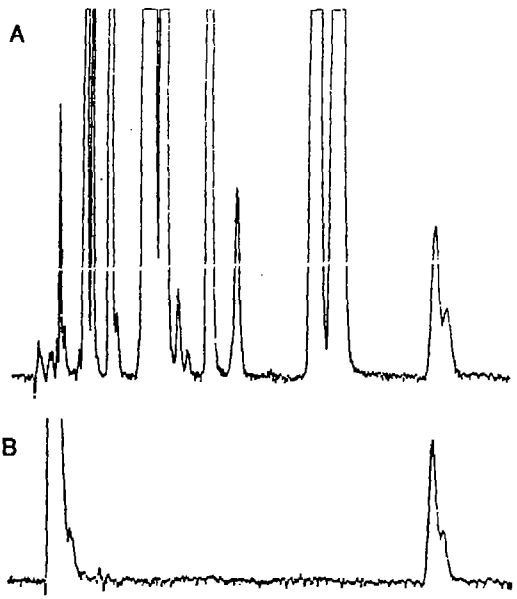


Fig 1. HPLC chromatograms. HPLC was performed according to Haglund et al. (4) using a Cosmosil 5-PYE column, a UV absorbance detector and hexane as the mobil phase. A: Halowax 1014 B: Rat liver extract 32 days after the dose.

Synthesis

A mixture of polychlorinated naphthalenes was synthesized via lithium aluminium hydride reduction of octachloronaphthalene (5). The major product, with the same GC retention time as the major bioaccumulating component in Halowax 1014, has with the PYE column and HPLC been shown to consist of two isomers. The two isomers was isolated and given to rat, and both were found to be retained in liver 32 days after the dose was given, as shown in Fig 2.

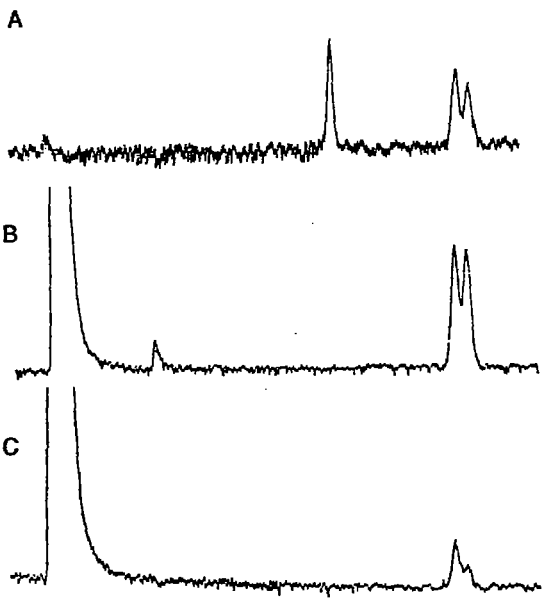


Fig 2. HPLC chromatograms of A: The synthetic mixture given to rat, B: Rat liver extracts 24 h after the dose and C: 32 days after.

## CONCLUSION

- The most bioaccumulating hexachloronaphthalene component in Halowax 1014 has been shown to be a mixture of at least two isomers.

- Both isomers have been found to be strongly retained in rat liver.

- A mixture of two hexachloronaphthalenes, synthesized via lithium aluminium hydride reduction of octachloronaphthalene, with the same retention time as the most bioaccumulating hexachlornaphthalene in Halowax 1014 were both shown to be retained in the liver.

It is thus possible that environmental samples contain both hexachloronaphthalene isomers, but as no successful separation by GC has yet been performed, further studies are required.

## ACKNOWLEDGEMENT

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