

Figure 1.  
Aroclor 1221  
10% DC-200

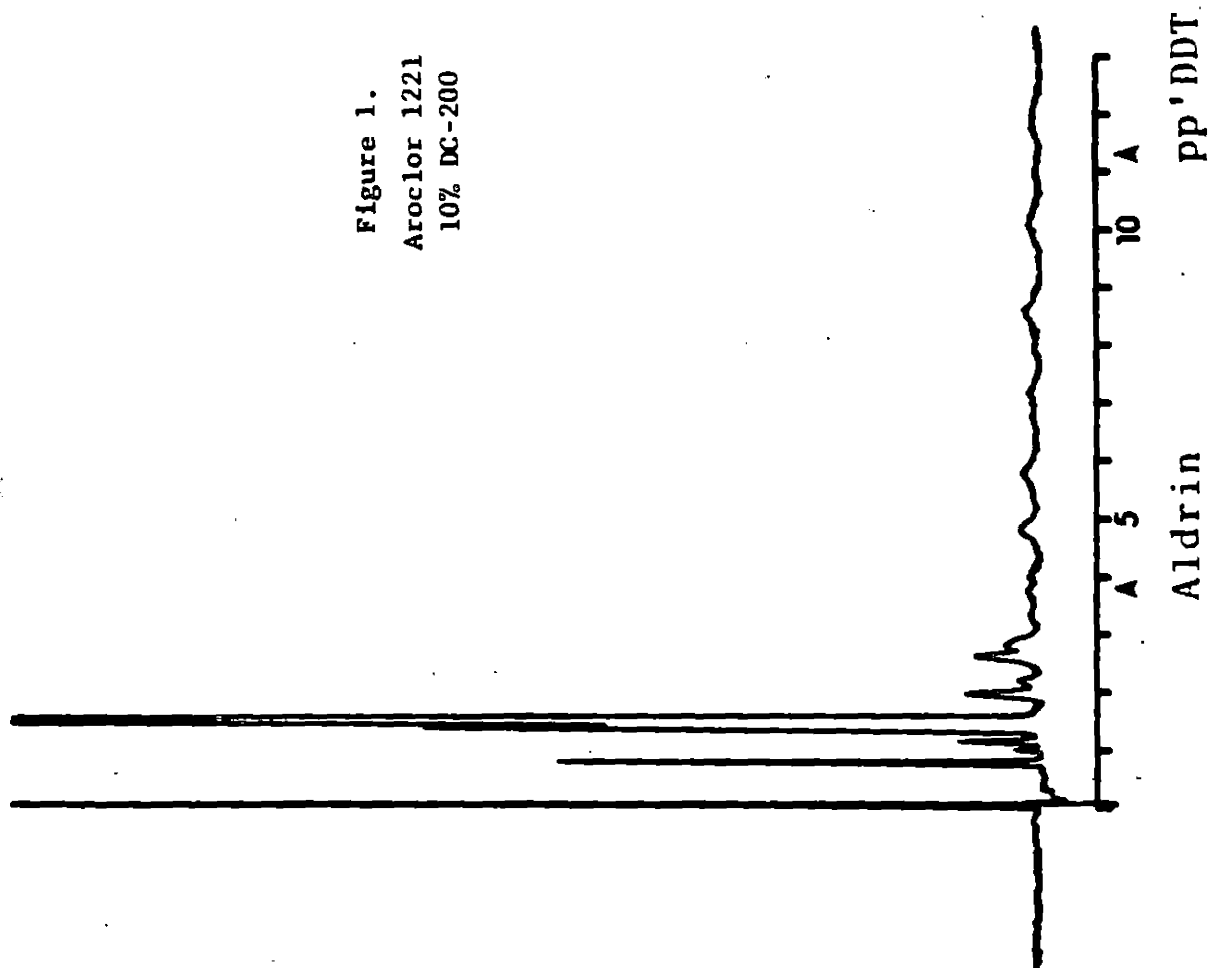
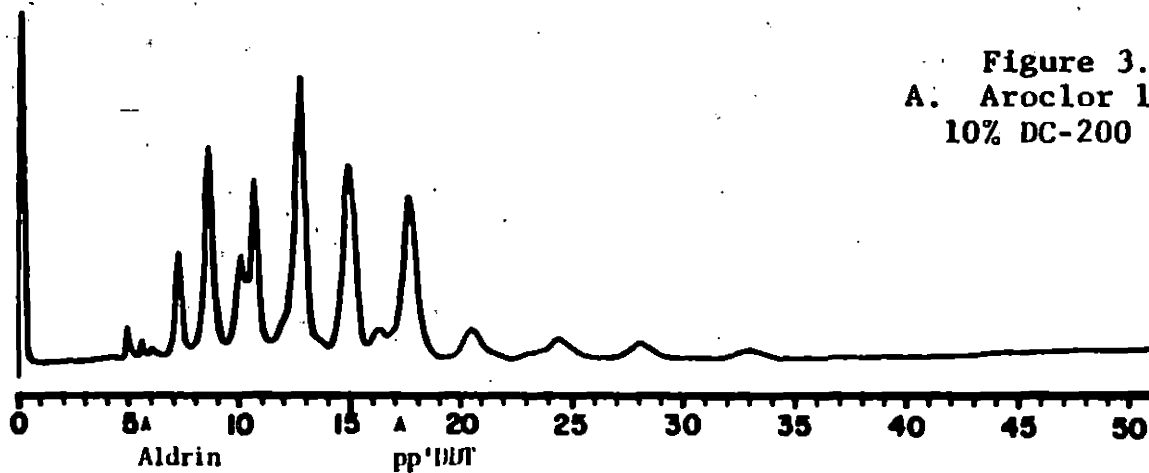
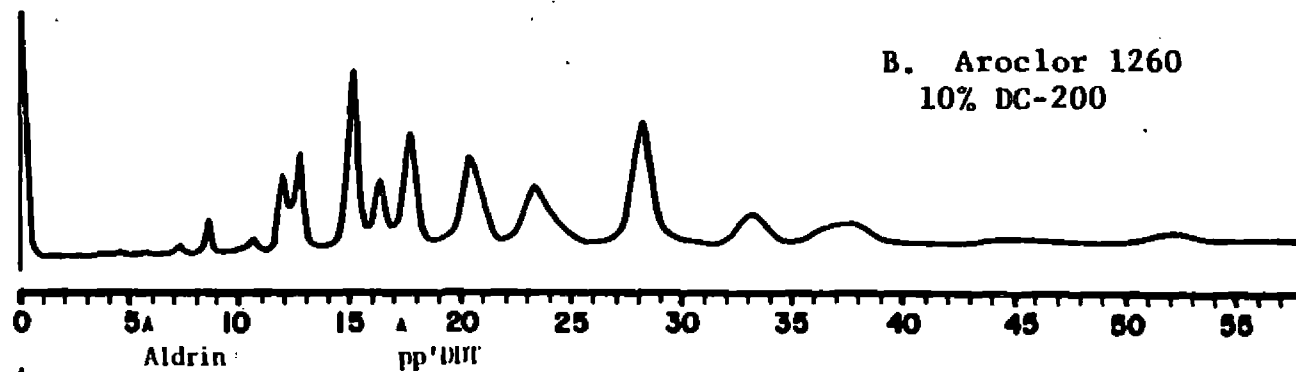


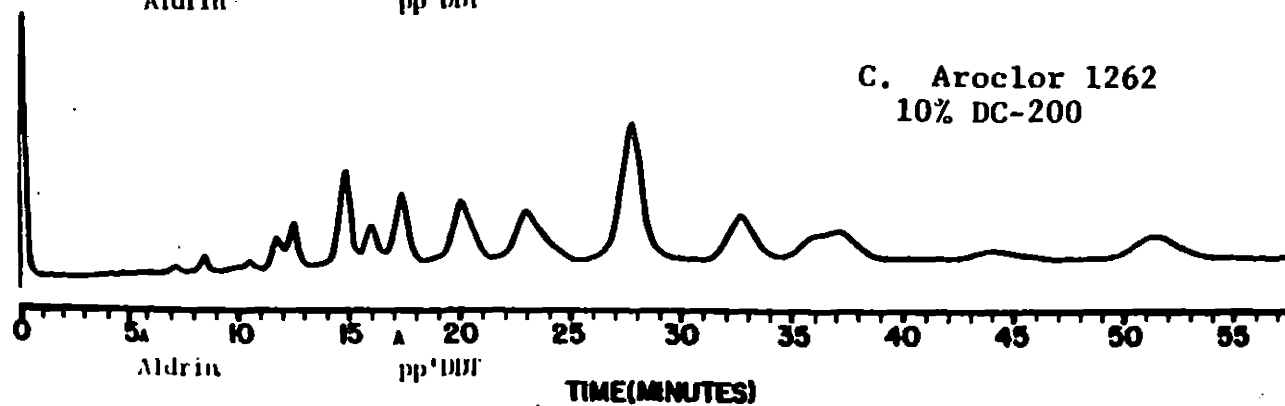
Figure 3.  
A. Aroclor 1254  
10% DC-200



B. Aroclor 1260  
10% DC-200

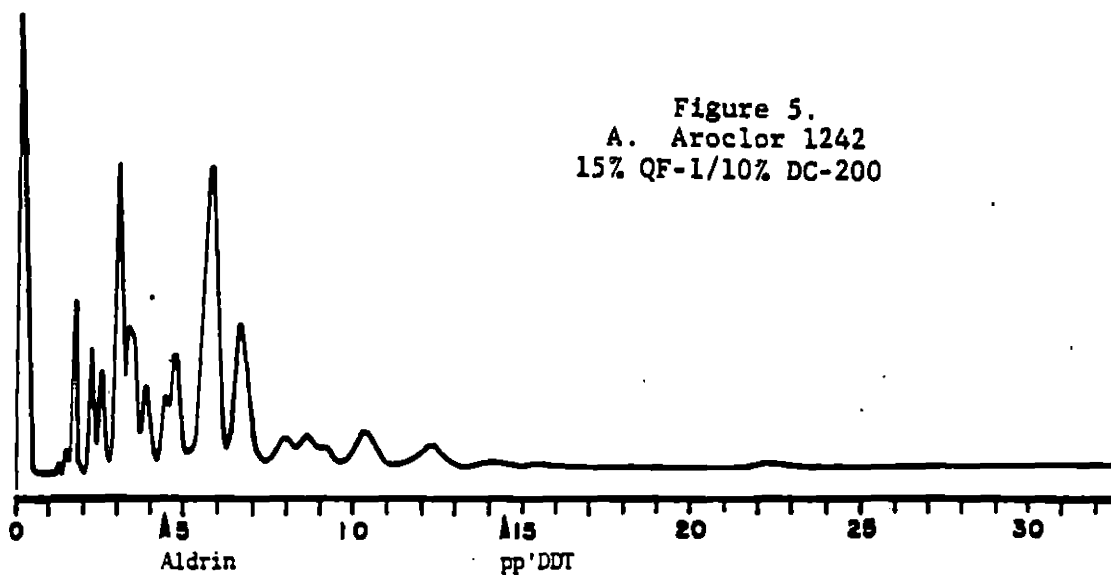


C. Aroclor 1262  
10% DC-200

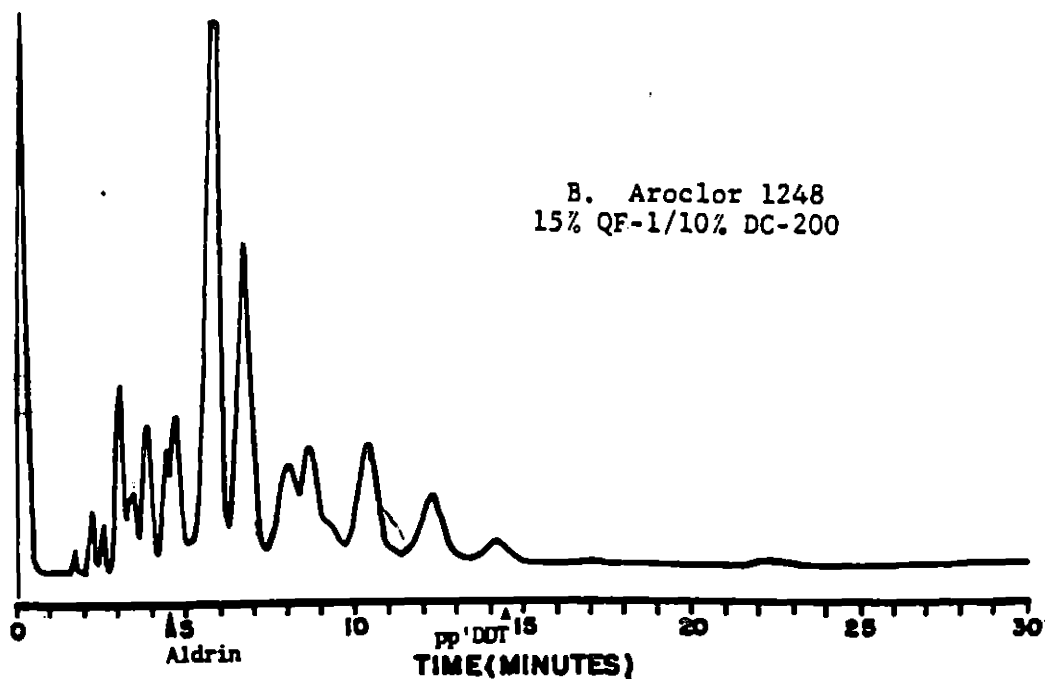


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Figure 5.  
A. Aroclor 1242  
15% QF-1/10% DC-200



B. Aroclor 1248  
15% QF-1/10% DC-200



only approximate. At such time, when one is able to synthesize the individual PCB components commonly found in the environment and identify them in terms of individual peaks, then the estimation remains, as stated, a relative concentration.

However, for most biological assessment work, the correct order of magnitude and accurate relative amounts of PCB provide the requisite information for this purpose.

### III. Contaminants, Impurities, or Other Chemical Moieties in PCBs

In the analysis of the polychlorinated biphenyls, one encounters a problem similar to that of the polychlorophenols and 2,4,5-T in that certain contaminants or impurities prevail. These impurities arise from the basic starting materials or compounds used in the synthesis and also from the processing conditions used in the chlorination procedures. In this respect, the series of compounds identified through GLC and mass spectrometry are somewhat similar in nature to the spectrum of dioxins found in working with chlorinated phenols, hexachlorophene, 2,4,5-T and related synthetic organic chemicals.

It has been noted in the bioassay of various Aroclors for toxicity, usually testing on chickens, that there was a variance in toxicity of certain PCB preparations. Since the occurrence of lesions resembled those of chick edema in birds fed PCB, this prompted a comparative study between three compounds, Phenoclor DP6, Clophen A60, and Aroclor 1260 by Vos et al in 1970 (24). In this study, the specific PCBs were fractionated, analyzed, and bioassayed using the chick embryo assay.

These studies revealed the presence of certain polar compounds which are present as impurities in the various PCBs and thus explain the variance in toxicity of certain commercial PCB preparations. In Table 2 some of the retentions and mass spectrometric data of some of the peaks identifying the presence of some dibenzofurans, chlorinated naphthalenes, and associated chlorinated biphenyls are indicated, proving the presence of impurities.

Table 2  
Relative Retentions, Mass Spectrometric Data on PCB Fractionated Sample

| Peak No. | Relative Retention | Mass Nos. and No. of Cl atoms per mol | Identity of Compound                           |
|----------|--------------------|---------------------------------------|------------------------------------------------|
| 1        | 1.40               | 304 (4 Cl)                            | Tetrachlorodibenzofuran                        |
| 2        | 1.58               | 332 (6 Cl)                            | Hexachloronaphthalene                          |
| 3        | 1.74               | 358 (6 Cl)<br>392 (7 Cl)              | Hexachlorobiphenyl<br>Heptachlorobiphenyl      |
| 4        | 2.42               | 338 (5 Cl)<br>392 (7 Cl)              | Pentachlorodibenzofuran<br>Heptachlorobiphenyl |
| 5        | 3.48               | 366 (7 Cl)                            | Heptachloronaphthalene                         |

# FOOTNOTES

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