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Residue Levels of Polychlorinated Terphenyls, Polychlorinated Biphenyls and DDT in Human Blood

by M. Docuchi and S. Fukano

Tokyo Metropolitan Research Laboratory of Public Health
Shinjuku-ku, Tokyo, 160 Japan

Since 1966 when the environmental pollution by PCBs was detected by Jensen, many investigaters identified PCB residues not only in the samples from environment such as bird, fish and animal but also in human milk, blood and adipose tissue. These results indicate that PCBs are widely dispersed through the biota.

PCTs which are used in similar industrial application to PCBs may be expected to accumulate in biological systems because of the similar chemical properties which these two substances share.

While their presence in environment has been reported by several investigaters(1-6), PCTs have not recieved so far as wide attention as PCBs.

Zitko identified the PCT residues in the eggs and the fatty tissue of herring gull(1), and Freudenthal found its presence in the river water, oyster and human fat(2). It was shown by Thomas that paperboad and food packing material contained PCTs(3). Nishimoto identified PCT residues in human fat and milk, but not in such food materials as meat, dairy products, vegetable and fish, and in the samples of water and sludge(4). Minagawa reported the residues of PCTs in human fat, some food and food packing materials and wild birds(5). We reported the levels of PCT in human fat collected from the Tokyo area(6).

This paper describes the detection of PCTs as well as PCBs and DDT compounds in human blood.

Materials and Methods

The analyses were made with 27 samples of human blood offered by the volunteers, 19 males and 8 females from 21 to 57 years old, in Tokyo Metropolitan Research Laboratory of Public Health in November 1973. No occupational contacts with PCBs and PCTs were recognizable with these subjects.

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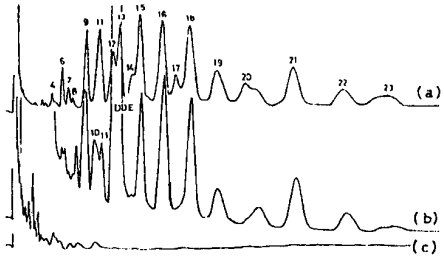

Figure 2. Gas chromatogram of PCB residues in human blood.
(a) : PCB standard (KC500 : KC600 = 2 : 1).
(b) : Human blood. (c) : Reagent blank.

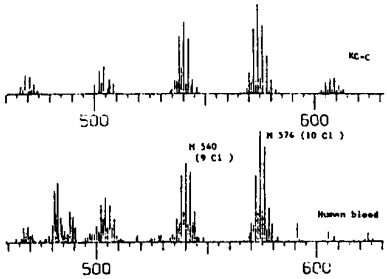

Figure 3. Mass spectrum of PCT residues in human blood at ionization energy of 70 eV.