

Polychlorinated Biphenyls in Non-carbon
Copying Paper

by

Masanori Kuratsune and Yoshito Masuda

Department of Public Health, Faculty of
Medicine, Kyushu University and
Department of Analytical Chemistry,
Daiichi College of Pharmaceutical
Sciences

DSW 028079

In an effort to clarify the distribution of polychlorinated biphenyls (PCB) in our environment, we were suggested that PCB or its related compounds might be used for production of non-carbon copying paper. Three of 4 Japanese brands of the paper on the market were therefore collected and examined for PCB. The paper consists of three different sheets, namely upper, middle, and lower ones. These sheets of paper were separately extracted with acetone in a Soxhlet apparatus for 3 days. The extracts were examined by a gaschromatography with an electron capture detector and 3 different liquid phases such as 5 % SE-30, 5 % QF-1, and 2.5 % DEGS coated on Chromosorb W AW DMCS. The gaschromatographic patterns observed were all identical with that of Kanechlor-300 (a brand of PCB) containing 43 % chlorine. The infrared absorption spectra and mass-spectra of the extracts also demonstrated the presence of Kanechlor-300 in them. The approximate concentration of PCB was 2-6 % in the upper and middle sheets and 0.02 % in the lower sheets.

To estimate how much PCB sticks to fingers by handling the copying papers, 3 independent sets of the upper, middle, and lower sheets, each consisting of 96 precut sheets of the same size, were counted by turning over all the sheets one by one by fingers. After counting, the fingers were washed with n-hexane once and the resulting n-hexane washings were examined for PCB. The amount of PCB in the washings, calculated as Kanechlor-300, ranged from 11.40 to 51.68 μ g in 5 subjects.

It was proved thus that PCB in the paper easily sticks to fingers when we handle it. It was also demonstrated that only one third of the PCB sticking to fingers can be removed by ordinary hand washing with soap and water.

In addition to the above domestic brands of paper, a few other samples of non-carbon copying paper were analyzed for PCB. One of them was a brand made by one of the leading paper makers in Britain and was obtained as packed in its original container in May 1971. Analysis showed that both upper and middle sheets of this make contained PCB. The second sample which was of American make and obtained as packed in its original container in June 1971 also contained a considerable amount of PCB. Another sample of paper which was sent to us for examination by a company in Thailand, however, did not contain PCB. We were told that it is also of American make.

Nevertheless to say, the free use of PCB for this kind of very popular copying paper necessarily leads to the uncontrollable heavy direct exposure of general population to it. In view of its chemical and pathological characteristics, we consider that the use of PCB for the paper should be discontinued in any country in order to prevent another occurrence of "Yusho". The Japanese makers of the paper are said to have quickly acted along this line in April 1971. To our regret, however, there have been no control measures set up by the government against the use of PCB and a considerable amount of

the PCB-polluted papers are still widely used in Japan.

DSW 028082