

LEVEL OF CHLORINATED ORGANIC COMPOUNDS IN THE ATMOSPHERE

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ABSTRACT

Samples of urban air around Kobe in Japan, were analysed for polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), PCBs, and other chlorinated compounds by using high resolution GC-MS/selected ion monitoring (HRGC-MS/SIM). The SIM was carried out in magnetic field switching technique which enable us to monitor simultaneously forty ions in this study. The average concentrations of PCBs was  $2.8 \text{ ng/m}^3$ , and PCDDs and PCDFs were  $8.6 \text{ pg/m}^3$  and  $8.8 \text{ pg/m}^3$ , respectively.

INTRODUCTION

In recent years, PCDDs and PCDFs have been found in environmental sample in many countries. Background levels of PCDDs and PCDFs in food, blue mussel and soil are reported in recent studies(1-4). In Japan as well as foreign countries, levels of PCDDs and PCDFs have been in a matter of concern and interest due to their high toxicity, and have been discussed for human health. Therefore, in order to estimate Japanese daily intake of both chemicals through inhalation, we present the levels of PCDDs and PCDFs in both particulate and vapor phase of urban air.

EXPERIMENTAL

An air sample was collected by a high volume air sampler with glass fiber filter(GFF) and polyurethane foam plugs(PUF). The particulates were sampled on GFF, while the vapor or aerosol phase compounds on PUF. Flow rate was  $40-50 \text{ m}^3/\text{hr}$ , and sampling time was 24hr. The total sample volume was in the order of  $1000 \text{ m}^3$ . The sampling was carried out at urban areas around Kobe, which is located in the central part of Japan and is one of big cities with millions population, during a period of November in 1985 to June in 1986.

The glass fiber filter and polyurethane foam plugs were extracted respectively with toluene and acetone using Soxhlet extractors.  $^{13}\text{C}$ -labeled-2,3,7,8-TCDD and TCDF were used as internal standards for checking recoveries of PCDDs and PCDFs throughout whole analytical procedure. After concentration, each extract was pre-cleaned-up with successive washings of conc.sulphuric acid. The extract was first cleaned-up on a Silica column and finally separated into two fractions on an Alumina column. The first fraction was named as a PCB fraction and the second a PCDD fraction. Each fraction was analysed in a SIM