

RESULTS AND DISCUSSION

1. PCDDs and PCDFs

Fig. 2 shows GC-MS-SIM chromatograms of tetra- to octa-CDDs in samples of fly ash from a municipal incinerator and of a typical urban air. As shown in this figure, number and kind of PCDD isomers in the urban air sample were almost identical to those of the fly ash. The isomeric patterns of tetra- to octa-CDDs were also observed to be similar to the corresponding one of the fly ash. The urban air, however, had relatively larger amounts of tetra- and octa-CDDs than did the fly ash (Fig. 4).

In case of PCDFs, all classes showed a high similarity of isomeric ratio between the two specimens (Fig. 3). As well as the case of PCDDs, there was also a difference in the congener group profile, showing the air sample to contain higher relative levels of tetra- and penta-CDFs than did the fly ash (Fig. 4).

From above results, both PCDDs and PCDFs in the urban air are surmised to be derived from domestic and industrial wastes incinerators. On the other hand, it is speculated that differences in congener group profiles of PCDDs and PCDFs might be caused by photochemical chlorination or dechlorination under sunlight after emission of them from the stacks of incinerators. In this analysis, no 2,3,7,8-TCDD with high toxicity was found in all samples.

2. PCBs

Fig. 5 shows GC-MS-SIM chromatograms at m/z 250 of trichlorinated biphenyls in a standard mixture and a urban air. We used Kanechlor equivalent mixture of KC-300, KC-400, KC-500 and KC-600 as a standard(6). Components in each congener group were identified by coincidences of a chlorine isotopic ratio at m/z $[M]^+$ and m/z $[M+2]^+$ and a retention time with those of standard. High similarities in the isomeric pattern between standard and urban air were found. This phenomenon was also recognized in all di- to deca-chlorinated classes, indicating the contamination source to be mainly attributed to dump sites or accumulated places of used commercial PCB products other than the wastes incinerators. This is interpreted by our result which the air sample had a distinguishable congener distribution from the fly ash, that is, the main congener groups were tri- to penta-PCBs in the former and hexa- to octa-PCBs in the later.

3. Pesticide analysis

p,p'-DDE, *trans*- and *cis*-chlordanes, *trans*- and *cis*-nonachlors, HCHs and HCB were respectively identified and determined by monitoring their own two different fragment ions in a SIM technique. In case of chlordanes, 90% amount of *trans*-chlordanes was found in PCB fraction, and the rest in a PCDD fraction. On the contrary, most of *cis*-nonachlor was present in the PCDD fraction. Another pesticides such as *p,p'*-DDE, α -HCH and HCB except β -HCH were all detected in the PCB fraction.

[Sampling system]

PCBs, chlordanes, tetra-, penta-, and hexa-CDDs, CDFs were mainly collected on PUF plugs, indicating them to be present in vapor phase or in aerosol. Especially, in case of dichlorinated biphenyls, the 95% amount of them was caught on the first two plugs. On the