

National Ambient Air Monitoring Measurement of Endocrine disrupters

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In this study, we investigated the pollution level of ambient air in Korea by Endocrine Disrupters (EDs). The target chemicals analyzed among others are phthalates, di-2-ethylhexyl adipate, benzo(a)pyrene, hexachlorobenzene and dioxin.

The number of the monitoring sites in 2000 are 26 sites, which two more sites are added up from 24 sites of 1999, and classified into 3 areas by residential area (including residential, commercial area, street & park), industrial area and the suburbs (including sub-agriculture and forestry, forest and the green area). The sampling periods were June to August and September to November and December to February in 2001. A GC-HRMS was used to analyze the concentrations of chemicals.

Compared with the 1999 results, 9 chemicals were detected in 2000. Dipropylphthalate which was not detected in 1999 is detected as a new chemical. The concentration levels of butylbenzylphthalate increased 1.665 to 5.535 ng/Nm³, while those of the rest 7 chemicals decreased from their concentration levels of 1999.

Analytical results of EDs were as follows; the concentration ranges for all samples were 0.02~268 ng/Nm³ and those of dioxin were 0.012~1.496 pg-TEQ/ Nm³. Dioxin was detected at 26 sites and the detection range is between 0.012 and 1.496 pg-TEQ/ Nm³. The detection ratio of Benzo(a)pyrene was 100% in the range between 0.10 and 1.66 ng/Nm³. The detection ratio of hexachlorobenzene was 100% in the range between 0.02 and 0.39 ng/Nm³. The detection ratio of di-ethylhexyl phthalate(DEHP) was 100% in the range between 14 and 268 ng/Nm³. The detection ratios of di-ethyl phthalate(DEP) and di-propyl phthalate(DprP) were 19% and 12% respectively, when a detection range was ND~<1. The detection ratios of di-n-butyl phthalate(DBP) and butyl benzyl phthalate(BBP) were 100% both in a detection range between 4 and 131 ng/Nm³ and between 2 and 11 ng/Nm³, respectively. The detection ratio of di-2-ethylhexyl adipate (DEHA) was 100% in the range between 1 and 27 ng/Nm³.

According to the monitoring results of air samples by the land utilization, relatively high concentration of benzo(a)pyrene, di-2-ethylhexyl adipate, di-ethyl phthalate, di-ethylhexyl phthalate, di-propyl phthalate, butyl benzyl phthalate and dioxin are detected in residential area, while hexachlorobenzene and di-n-butyl phthalate are detected in industrial area.

It is expected that in some case, the possibility of relatively high concentration in residential area compared to industrial area contributed to inclusion of commercial area.

Continuous investigation needs to be done with a larger sample set from highly contaminated area.