

日本の金沢の沿道大気汚染モニタリングステーションにおけるPM_{2.5}中多環芳香族炭化水素類およびニトロ多環芳香族炭化水素類の特性

Characteristics of PM_{2.5}-bound polycyclic aromatic hydrocarbons and nitro-polycyclic aromatic hydrocarbons at a Roadside Air Pollution Monitoring Station, Kanazawa, Japan

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【Introduction】

Polycyclic aromatic hydrocarbons (PAHs) and nitropolycyclic aromatic hydrocarbons (NPAHs) mainly originated from vehicles exhaust, industrial processes, and biomass combustion. PAHs and NPAHs cause the health risk due to its potential toxicity includes carcinogenicity and/or mutagenicity. In this study, PM_{2.5} was collected at a Roadside Air Pollution Monitoring Station in Kanazawa. Our aims were to analysis the seasonal variations of concentrations, composition of PAHs and NPAHs in PM_{2.5} and evaluate their human health risk.

【Materials and Method】

Nine PAHs include fluoranthene (Flt), pyrene (Pyr), benz[*a*]anthracene (BaA), chrysene (Chr), benzo[*b*]fluoranthene (BbF), benzo[*k*]fluoranthene (BkF), BaP, benzo[*ghi*]perylene (BgPe) and indeno[1,2,3-*cd*]pyrene (IDP) were analyzed by HPLC with fluorescence detection. Six NPAHs include 9-Nitroanthracene (9-NA), 3-Nitrophenanthrene (3-NPer), 1-nitropyrene (1-NP), 7-nitrobenz[*a*]anthracene (7-NBaA), 6-nitrobenzo[*a*]pyrene (6-NBaP) were determined by HPLC with a chemiluminescence detector.

【Results and Discussion】

The mean atmospheric concentrations of PAHs and NPAHs were both highest in winter ($1.0 \pm 0.3 \text{ ng/m}^3$ and $5.9 \pm 2.5 \text{ pg/m}^3$) and lowest in summer ($0.3 \pm 0.1 \text{ ng/m}^3$ and $1.3 \pm 1.0 \text{ pg/m}^3$). A similar trend was reported in our previous studies, this was possibly because in summer might cause a more intense photochemical degradation of PAHs and NPAHs. Flt and Pyr were dominant PAHs and 1-NP was dominant NPAHs in PM_{2.5} from traffic emission. The DRs used in our study were effectual to identify the emission source. The carcinogenic risk assessment showed a low risk in our sampling site.