Abstract

[Research Title]

Development of High-throughput Analysis and Remediation Technology of Per- and Polyfluoroalkyl Substances

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[Abstract]

Development of High-throughput Analysis and Remediation Technology of Per- and Polyfluoroalkyl Substances were carried out in cooperated with Osaka City Research Center of Environmental Science and several industry partners. Per- and polyfluoroalkyl substances (PFAS) are used in various applications, but their spatiotemporal variations in the ambient air and their potential sources are yet to be well understood.

Herein, we developed novel technologies including a portable air sampler to collect various types of PFAS (including 29 ionic PFAS and 41 neutral PFAS) in the particulate and gaseous phases of the ambient air, non-target analytical method with artificial intelligence technology.

Thirty-eight PFAS were detected in the environmental samples collected between 2022 and 2023 at five locations in Japan. Our results revealed that PFAS profiles in the ambient air were predominated by 6:2 fluorotelomer alcohol and two short-chain PFAS (perfluorobutane sulfonic acid and perfluorobutanoic acid), with median levels of 245 pg m³, 117 pg m³, and 78 pg m³, respectively.

Several new materials for remediation of PFAS in water and soil were also developed and tested for their performance to remove PFAS from Japanese environment.

[References]

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