

空氣品質

春節運輸期間大氣顆粒物中環境持久性自由基的健康風險

**Health Risk of environmentally persistent free radicals on
atmospheric particulate matter at spring festival travel season**

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Abstract

The present study collected samples using Micro-Orifice Uniform Deposit Impactor and Personal Environmental Monitors at Tainan, Taiwan, in order to measure the EPFRs in particulate matter (PM) during the Spring Festival travel season. Sampling was conducted during the Spring Festival travel season from February 8th to February 15th, 2024, after the Spring Festival travel season from February 15th to February 22th, 2024, and February 22th to February 29th, 2024. The sampling sites are near the Rende interchange of the highway (A (East) and B (West)) and Chimei museum (C), respectively.

Herein, the pollution characteristics and sources of EPFRs, PAHs, and carbon composition are investigated in 24 samples of mixed particle-size particulate matter in five size fractions (18 μm , 18 -10 μm , 10 - 2.5 μm , 2.5-1 μm , < 1 μm). The concentrations of PM-bound EPFRs ranged from 1.94×10^{11} to 2.71×10^{12} spins/m³. We used the equivalent EPFRs in cigarette tar to estimate health risk, and the amount of EPFRs inhaled by people is equivalent to approximately 0.006-0.1 cigarettes per person per day per day. The major carbonaceous content in PM_{2.5} was organic carbon (OC), and the mass ratios of organic and elemental carbons (OC/EC) are between 2.07-2.47.

Keywords: *Spring Festival travel season, PM_{2.5}, EPR, EPFR*