

Seasonal Source-Receptor Relationships in a Petrochemical Industrial District over Northern Taiwan

張怡怡

Chiang PC;Chang EE;Chiang HL*;;

摘要

Abstract

This study investigated the relationships between meteorological data, pollution sources, and receptors over northern Taiwan. During the intensive sampling period in summer 1992, the weather was controlled predominantly by a Pacific subtropical high and by Typhoon Mark. During the other intensive sampling period in winter 1993, while a cold frontal system approached Taiwan, the northeasterly winds prevailed most of the time. The local circulation such as land-sea breeze only developed under weak synoptic environment. Particle concentrations and element composition in winter were higher than in summer. This can be attributed to the high convection of air mass, which leads to the vertical dispersion of pollutants in summer. In addition to the subtropical high pressure, typhoons are frequently accompanied with high-wind speeds and unstable weather conditions that also dilute and eliminate the pollutants. In winter, the prevailing northeasterlies might carry pollutants from Midland China. Furthermore, the anticyclone system develops a stagnant condition that easily leads to pollutant accumulation. In this case, the wind direction affected the source contribution of the receptor and the PM₁₀ displays a higher correlation with coarse and fine particulate than meteorological parameters in summer. In addition, the mixing height shows a high correlation with PM₁₀ in winter.