摘要

由於台灣地區人口與經濟快速成長，使得汽機車及工廠數量大幅增加，交通及工廠排放之廢氣造成空氣汙染問題日益嚴重，因此，找出交通及工業區之懸浮微粒(PM_{10})濃度影響因素對鄰近居民健康極為重要。

本研究蒐集2011至2013年工業與交通兩個種類七個空氣品質監測站(頭份、線西、前鎮、永和、中壢、復興與鳳山)之氣象與化學資料，以時PM_{10}為應變數，氣象因子(氣溫、相對溼度及風速)與化學因子(CO, NO_2, O_3, SO_2)為自變數進行皮爾森相關分析，判斷各因子與時PM_{10}之線性相關程度；以多元線性迴歸分析建立的時PM_{10}濃度線性迴歸方程式加以探討。而時PM_{10}濃度超過空氣品質標準則以羅吉斯迴歸分析建立之機率模式，探討七個測站影響因子的關聯。

工業與交通空氣品質監測站，皆位於都市區附近，大氣擴散能力隨著氣溫降低而下降，因此時PM_{10}高濃度時間多發生於凌晨或夜晚；相對溼度增加易使空氣中懸浮微粒膠結且增加重量而沉降，因此有降低時PM_{10}濃度之效果，故氣溫、相對溼度等因子與時PM_{10}濃度皆呈現負相關。工業空氣品質監測站之時PM_{10}濃度則與一氧化碳和臭氧等化學因子相關性最高；交通空氣品質監測站時PM_{10}濃度與二氧化氮與

臭氧等化學因子相關性最高。當時PM_{10}濃度超過空氣品質標準時，七個測站，其主要影響因子差異不大。

關鍵字：懸浮微粒、迴歸分析、羅吉斯迴歸

ABSTRACT

Due to the rapid of Taiwan's population growth and economic development, the amount of gas emission from transportation and industrial sector increased significantly and caused air pollution problem. Therefore, it's an important issue to study the factors affecting concentration of suspended particulate matter (PM_{10}) in traffic and industrial areas.

The metrological and chemical data from 2011~2013 at seven air quality monitoring stations in traffic and industrial areas were collected in this study. Pearson's correlation coefficient is applied to analyze the relationship between each factor and hourly PM_{10} concentration. Linear regression equation could probe the main effect factor of hourly PM_{10} concentrations by multiple linear regression analysis. Logistic regression analysis could explore the relationship between each factor and hourly PM_{10} concentrations exceeding the air quality standards derived from the seven air quality monitoring stations

Because the atmospheric diffusion capacity is poor when the temperature decreased, hourly PM_{10} concentration increases easily especially at morning or night in traffic and industrial air quality monitoring stations located near the metropolitan area. When relation humidity increases, the mass of particulate matter would increase so the hourly PM_{10} concentration would decrease. Therefore, it is negative relation between metrological factor and hourly PM_{10} concentration. Hourly PM_{10} concentration shows high relation with CO and O_3 at

industrial air quality monitoring stations and with NO_2 and O_3 at traffic air quality monitoring stations. When hourly PM_{10} concentrations exceeded the air quality standards, the main influencing factors were little difference on seven air quality monitoring stations.

Keywords: PM_{10}, Regression Analysis, Logistic Regression