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邯郸市大气颗粒物污染特征的监测研究

Characteristics of atmospheric particulate matter pollution in Handan City

关键词: [PM_{2.5}](#) [PM₁₀](#) [TEOM](#) [邯郸市](#)

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摘要: 使用振荡天平颗粒物在线监测仪连续监测了邯郸市PM₁₀和PM_{2.5}浓度,分析了2012年7月31日—12月2日4个月内PM₁₀、PM_{2.5}的浓度水平、时变规律和PM_{2.5}/PM₁₀的变化情况.结果表明,监测时段内PM₁₀和PM_{2.5}的日均浓度平均值分别为208.4 μg·m⁻³和99.1 μg·m⁻³,是国家二级标准的1.4倍和1.3倍;浓度超标的天数占总观测天数的61.6%和60.0%,其污染程度与北京、天津相当,属污染较严重的地区.PM_{2.5}/PM₁₀在19.3%~89.8%之间周期性波动,平均值为49.4%,接近北方城市的平均水平.PM₁₀和PM_{2.5}的浓度变化具有很好的正相关性;日均值在4个月中呈现明显的周期性变化和月际波动,10、11月的PM₁₀和PM_{2.5}浓度变化剧烈且大大高于8、9月份.PM₁₀和PM_{2.5}浓度一天中小时均值的变化呈同步的双峰型分布,最高值出现在9:00和20:00左右,最低值出现在15:00~17:00之间.本研究系统分析了夏秋季节邯郸市大气颗粒物污染状况,以为当地颗粒物污染的控制提供科学依据.

Abstract: Concentrations of PM_{2.5} and PM₁₀ were continuously observed at our newly constructed environmental monitoring station in Handan of Hebei province using automatic on-line tapered element oscillating microbalance(TEOM)particulate monitor. The concentration level, temporal variation characteristics of PM₁₀, PM_{2.5} and the variation status of PM_{2.5}/PM₁₀ were analyzed for the four months from July 31 to December 2, 2012. The results show that average daily concentration of PM_{2.5} and PM₁₀ during the four months are 208.4 μg·m⁻³ and 99.1 μg·m⁻³, which are 1.4 and 1.3 times their respective national secondary standard. The percentages of the days exceeding the national secondary air quality standard are 61.6% and 60.0% for PM₁₀ and PM_{2.5}, respectively. Particulate pollution is serious in Handan, which is similar to that in Beijing and Tianjin. PM_{2.5}/PM₁₀ ranged from 19.3% to 89.8% with the average value of 49.4%, which is close to the average level of northern cities in China. The concentrations of PM_{2.5} and PM₁₀ are positively correlated. The daily average concentrations of PM₁₀ and PM_{2.5} show obvious periodic variations and monthly fluctuations. The average concentrations in October and November are much higher than in August and September. The diurnal variations of PM₁₀ and PM_{2.5} concentration show synchronous bimodal distribution. The maximum value appears at about 9 am and 8 pm and the minimum value appears between 3 pm and 5 pm. This study systematically analyzed characteristics of particulate matter pollution in Handan city, providing scientific support for the future controls on the severe local particulate matter pollution.

Key words: [PM_{2.5}](#) [PM₁₀](#) [TEOM](#) [Handan City](#)

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