

王占山,张大伟,陈添,李云婷,董欣,孙瑞雯,潘丽波.2013年北京市NO₂的时空分布[J].环境科学学报,2015,35(5):1529-1536

2013年北京市NO₂的时空分布

Spatiotemporal characteristics of NO₂ in Beijing in 2013

关键词: [北京市](#) [NO₂](#) [时间分布](#) [空间分布](#) [PM_{2.5}](#) [大气氧化性](#)

基金项目: [北京市科技计划课题\(No. Z131100006113009\)](#); [环保公益性行业科研专项\(No.201409005\)](#); [国家科技支撑计划课题\(No. 2014BAC23B03\)](#)

作者 单位

王占山 北京市环境保护监测中心,北京 100048

张大伟 北京市环境保护监测中心,北京 100048

陈添 北京市环境保护局,北京 100044

李云婷 北京市环境保护监测中心,北京 100048

董欣 北京市环境保护监测中心,北京 100048

孙瑞雯 北京市环境保护监测中心,北京 100048

潘丽波 中国环境科学研究院环境基准与风险评估国家重点实验室,北京 100012

摘要: 对2013年北京市35个自动空气质量监测子站的NO₂数据进行分析,探讨NO₂的时间分布特征、空间分布特征以及与PM_{2.5}和大气氧化性的相关性关系.结果表明,NO₂浓度由高到低的季节依次是冬季、秋季、春季和夏季,平均浓度分别为66.6、58.3、54.7 $\mu\text{g} \cdot \text{m}^{-3}$ 和45.8 $\mu\text{g} \cdot \text{m}^{-3}$;NO₂浓度由高到低的监测站依次为交通站、城区站、郊区站和区域站,年均浓度分别为78.6、57.9、48.5 $\mu\text{g} \cdot \text{m}^{-3}$ 和40.3 $\mu\text{g} \cdot \text{m}^{-3}$.NO₂月均浓度呈波浪型分布,在1月份、3月份、5月份和10月份各出现一个峰值.整体来看,区域站NO₂日变化曲线呈现单峰型分布,其他站点为双峰型分布.2013年NO₂浓度呈现“反周末效应”,即周末大部分时段NO₂浓度高于工作日.分地区来看,年均NO₂浓度由高到低的依次是城六区、西南部、东南部、西北部和东北部.各站点NO₂浓度与PM_{2.5}和OX浓度均为显著正相关,表明NO₂可以通过增加前体物浓度和增强大气氧化性两方面造成PM_{2.5}浓度升高.

Abstract: NO₂ data from 35 automatic air quality monitoring stations in Beijing in 2013 were analyzed to investigate spatiotemporal characteristics of NO₂ and also correlation between NO₂, PM_{2.5} and also atmospheric oxidation. The results showed that the average concentration of NO₂ is the highest in winter followed by autumn, spring and summer with the average concentration of 66.6, 58.3, 54.7 $\mu\text{g} \cdot \text{m}^{-3}$ and 45.8 $\mu\text{g} \cdot \text{m}^{-3}$, respectively. The average concentration of NO₂ is the highest at the traffic station, followed by the urban station, the suburban station and the regional station with the average concentration of 78.6, 57.9, 48.5 $\mu\text{g} \cdot \text{m}^{-3}$ and 40.3 $\mu\text{g} \cdot \text{m}^{-3}$, respectively. Monthly average concentration of NO₂ changes in a wave-shape curve with peak values during January, March, May and also October. Generally, diurnal variation of NO₂ at the regional station showed unimodal distribution, while other stations showed bimodal distribution. Concentrations of NO₂ were higher during weekends most of the time, which indicated anti weekend effect. Annual average concentration of NO₂ in different regions show different concentrations at different stations. The highest concentration can be found at the central six districts, while lower concentration at the southwest, southeast, northwest and northeast. Concentrations of NO₂ were significantly positively correlated with concentrations of PM_{2.5} and OX, which indicated that NO₂ could be the factor behind increase in PM_{2.5} concentrations by increasing precursor concentrations and enhancing atmospheric oxidation.

Key words: [Beijing](#) [NO₂](#) [spatiotemporal characteristics](#) [PM_{2.5}](#) [atmospheric oxidation](#)

摘要点击次数: 800 全文下载次数: 1325

关闭

下载PDF阅读器

您是第27503437位访问者

主办单位：中国科学院生态环境研究中心

单位地址：北京市海淀区双清路18号 邮编：100085

服务热线：010-62941073 传真：010-62941073 Email: hjkxb@rcees.ac.cn

本系统由北京勤云科技发展有限公司设计