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机动车尾气排放对城市空气质量的影响研究——以乌鲁木齐市春节前后对比分析

Impact of automobile vehicles exhaust emissions on metropolitan air quality: Analysis study on the air pollution change before and after the Spring Festival in Urumqi City, China

关键词: [机动车](#) [春节](#) [空气质量](#) [尾气排放](#) [污染](#)

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摘要: 随着我国经济的高速发展, 机动车尾气逐渐成为城市大气污染物的主要来源之一。在2013年2月5—18日春节前后, 乌鲁木齐市节假日前3 d大量机动车外流, 节日期间2月10—12日滞留市内的机动车停运, 通过对比春节前后乌鲁木齐市汽车流出量和油耗减少量, 分析该时段5项大气污染物逐小时浓度变化, 研究机动车尾气对乌鲁木齐市大气污染的潜在贡献和影响程度。结果表明: 春节机动车停运期间, 市区机动车流量下降明显, 成品油消耗量减少约60%, 尽管天气条件以不利于大气污染物扩散为主, 但PM_{2.5}、PM₁₀、SO₂、NO₂和CO等5项大气污染物浓度均降至当月最低值(且均在达标范围内), 分别比节假日前下降44.2%、49.3%、54.5%、28.2%和3.7%。因此, “煤改气”工程实施后, 乌鲁木齐市的煤烟污染得到极大改善, 乌鲁木齐市大气污染类型已由煤烟型向机动车尾气混合型转化。提高成品油品质将促进减少城市机动车尾气污染, 在当前的油品标准下, 重大节假日期间机动车停驶有助于显著改善城市空气质量。

Abstract: With the rapid economic development in recent years, automobile vehicles exhaust emission has become one of main air pollution sources in major Chinese cities. During the time before and after the Spring Festival period in February 5–18, 2013, large amount of automobile vehicles moved outside of Urumqi city 3 days before the Festival, and commercial automobile vehicles were prohibited in business from February 10 to 12. Therefore, we conducted a comparative investigation on the flow rate of automobile vehicles and fuel consumptions in Urumqi city, analyzed the change of hourly concentration on five air pollutions, and studied the potential contribution and impact of air pollution by vehicles exhaust emissions. Results showed that during the period of prohibiting commercial automobile vehicles, the automobile vehicle flow rate apparently decreased, with fuel consumption reduced approximately about 60%. Although the meteorological condition was unfavorable for pollutant dispersion during the Spring Festival, concentrations of PM_{2.5}, PM₁₀, SO₂, NO₂ and CO dropped to the monthly lowest levels and decreased by 44.2%, 49.3%, 54.5%, 28.2% and 3.67%, respectively, compared with those before the Festival. Consequently, the air pollution in Urumqi was improved after the implementation of ‘replacement of coal by natural gas’ project, and atmospheric pollution began to change from coal burning into mixed automobile vehicle exhaust emission. Elevating the quality of oil production will reduce the air pollutions from automobile vehicle exhaust emissions. Under the current national standards of oil production, prohibition of commercial automobiles will significantly improve the air quality of Urumqi city during the big Festival.

Key words: [automobile vehicle](#) [Spring Festival](#) [air quality](#) [exhaust emission](#) [pollution](#)

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