

Seasonal Variations of NO₂ and SO₂ Concentrations in Tirana's Air

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Abstract: Road traffic is the main contributor to NO₂ and SO₂ air pollution in Tirana. These air pollutants' concentration levels are at their highest in the sections of the capital with the heaviest traffic density. 24-hr measurements of NO₂ and SO₂ air concentrations were carried out over a 15-month period at one of Tirana's most congested crossroads. To verify if seasonal variations of SO₂ and NO₂ concentrations are statistically significant a one-way ANOVA was carried out together with Tukey's test, using the Minitab software. The resulting NO₂ annual mean concentrations exceeded the World Health Organization's recommended annual mean concentration but they respected the respective Albanian Standard. Significant distinction resulted between NO₂ measured concentrations in spring & summer compared to the autumn & winter. On the other hand, the 24-hr mean concentrations of SO₂ resulted well below the Albanian and the European Community Standards. Improvements in fuel quality over the last two decades such as a reduction in sulfur content explain the low air concentrations of SO₂, nevertheless, a lot remains to be done regarding their complying with EURO-5 Standards. Significant distinction resulted between spring-summer-autumn compared to winter. Because air pollutants' concentrations resulted to be highest in the spring-summer period for both pollutants and also because concentrations of air pollutants are well-correlated to traffic density, good traffic management especially in the spring-summer period and improvement of existing road infrastructure are recommended as necessary steps to be taken by Tirana Municipality in order to improve the air quality in Albania's capital.

Keywords: *nitrogen dioxide, sulfur dioxide, seasonal variation, ANOVA, road traffic, Tirana, Albania.*

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