CRITICAL TRANSFORMATIONAL CHARACTERISTICS OF GROUND LEVEL OZONE FROM NITROGEN DIOXIDE IN URBAN AREA

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Abstract

The prior aim of the study is to investigate the characteristic of the ground level ozone from its precursor during critical transformation time in urban area. A multivariate analysis was carried out using the dataset of three selected urban area from 2013 to 2014. The mean O_3 concentration recorded throughout 2013 and 2014 in Kota Bharu, Putrajaya and Shah Alam is 15.56 ppb, 21.34 ppb and 19.17 ppb, respectively, while the mean O_3 concentration during critical transformation time (CCT) is 13.07 ppb, 13.51 ppb and 12.14 ppb, respectively. It has been found that the O_3 concentration is high starting from March to May due to the Southwest monsoon season in Putrajaya and Shah Alam. However, O_3 concentration in Kota Bharu is recorded to be the highest starting approximately from May 2013, while in 2014, the O_3 concentration is high starting from January to February, then from April to August. CCP was observed to be occurred within the CCT, from 8.00 a.m. to 11.00 a.m., using the diurnal plot and the O_3 maxima was observed, usually after CCT at approximately 2.00 p.m. to 4.00 p.m. A model was developed by using multiple linear regressions (MLR) to fit the observed data obtained from the monitoring site. A relatively low R^2 value (0.05426) is obtained from the scattered plot, which indicates that the O_3 concentration is difficult to be predicted in atmospheric study.

Keywords: Tropospheric ozone; Photochemical reactions; Transformation chemistry; Conversion point