

# CHARACTERISTICS OF THE INTERACTIONS PATTERN OF SURFACE OZONE WITH ITS PRECURSORS IN MIE PREFECTURE OF JAPAN

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Surface ozone is a major cause of concern on urban air quality for the Mie Prefecture of Japan both in terms of annual ozone exceedance days and elevated ozone level. To characterize the surface ozone formations, interaction patterns ozone precursors (nitrogen oxide and hydro carbon compounds (VOC)) have been statistically analyzed for four selected monitoring sites of different land habitats namely coastal-industrial, inland urban, mountain based urban, and coastal resort city. Hourly ambient data on air criteria pollutants (1991-2001) of Ministry of the Environment, Japan were used to investigate the diurnal and seasonal variations of the precursors and the photochemical potentials. Relationships of ozone with NO<sub>2</sub>-NO and NO<sub>x</sub>-VOC's ratios were investigated to determine the proportionate contribution of these precursors. Study found that despite relatively lower concentrations of precursors (NO<sub>x</sub>, VOC's), coastal cities experience relatively higher daily mean ozone level than the inland urban cities. Relationships exist between ozone and its precursors as well as between nitrogen oxide and VOC's (Methane and Non-methane) but the degree of such relationships vary with seasons and land habitat types. Relatively stronger correlations exists between NO<sub>x</sub> and VOCs in the inland city ( $R^2 > 0.60$ ) compare to the coastal cities ( $R^2 < 0.30$ ) and between Ozone and NO<sub>2</sub>/NO in inland cities ( $R^2 > 0.40$ ) compare to the coastal cities ( $R^2 < 0.20$ ). Nitric Oxide limiting condition and meteorological effects might cause the higher ozone level in the coast cities particularly in Toba. Key word: Surface ozone, Ozone precursors, Interaction Patterns, NO<sub>2</sub>/NO ratio