SMOG STUDY USING TWIN CHAMBERS FILLED WITH AMBIENT AIR

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The photochemical reactions of ambient air were investigated in two identical 6-m3 smog chambers. Each smog chamber consisted of a housing, a Teflon bag, blacklights, injection ports, sampling ports, and outdoor air supply system. The maximum NO2 photolysis rate is 0.5 min-1. The reference chamber was filled with unfiltered ambient air, on the other hands the test chamber was filled with filtered ambient air using particulate air filter and/or gas filter. The gaseous species such as O3, NOx, NH3, SO2 and CO were monitored continuously by using gas analyzers, the aromatic hydrocarbons were analyzed by using GC-FID, and the aerosol size distribution was measured by using a scanning mobility particle sizer during the irradiation. In this study, the contribution of primary air pollutants such as primary aerosols, volatile organic compounds, NOx, NH3, and SO2 to the aerosol and ozone formation was characterized by comparing photochemical reactions occurred in two Teflon bags. In addition, the light intensity effect was examined. It was found that the initial aerosol concentration of ambient air affects the ozone production rate and the aerosol formation. The aerosols were more easily formed and grown under low aerosol concentration environment. The ozone production rate depended on the initial aerosol concentration and unidentified species.