

6.168 Emission sources of C₂-C₇ non-methane hydrocarbons at an urban site of western India..

Early Career Scientist

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Abstract:

The mixing ratios of non-methane hydrocarbons (NMHCs) were measured at an urban site of Udaipur (26.58°N, 73.68°E, 598 m amsl) in western India. The air samples were collected during February 2015-January 2016 and analyzed for many NMHCs using a thermal desorption-gas chromatograph-flame ionization detector (TD-GC-FID) system. The mixing ratio of C₂-C₇ NMHCs show strong diurnal variation with peak during morning and evening rush hours for most of the species. In the winter season, the average mixing ratios of aromatic compounds benzene (C₆H₆) and toluene (C₆H₇) during morning hours were 1.6±0.1ppbv and 2.5±0.4 ppbv, respectively. In the monsoon season, the NMHCs do not show significant diurnal dependence. Most of NMHCs show strong seasonal variation with highest during winter season and lowest during monsoon season. The seasonal change in long-range transport, boundary layer height and OH concentrations seem to contribute in the seasonal variations of NMHCs. The mixing ratio of isoprene shows correlation with solar flux and temperature in indicating its emission from biogenic sources. The observed NMHCs showed good correlation with each other in winter ($r^2 > 0.5$) suggesting their emissions from common or co-located sources. The emission of natural gas and use of liquid petroleum gas (LPG) contribute to elevated levels of ethane and propane. While emissions from vehicular exhaust are the dominant sources of ethene, propene, acetylene, benzene and toluene.