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The role of volatile organic compounds in the polluted urban atmosphere of Bristol, England

A. C. Rivett, D. Martin, D. J. Gray, C. S. Price, G. Nickless, P. G. Simmonds, S. J. O'Doherty, B. R. Grealley, A. Knights, and D. E. Shallcross

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Abstract. The results of a field campaign carried out from early spring through to the late summer of 2000, in Bristol, England, are presented. Continuous measurements of over 40 hydrocarbons have been made at an urban background site, located at Bristol University, for approximately nine months using a Gas Chromatography - Flame Ionisation Detection (GC-FID) system and for a selection of halocarbons for approximately one month using a Gas Chromatography - Electron Capture Detection (GC-ECD) system. In this paper we present the time-series of the nine halocarbons and selected hydrocarbons. Daytime and night-time hydroxyl radical concentrations have been estimated based on the diurnal variations of a selection of the measured hydrocarbons. The average summer daytime concentration of OH was found to be 2.5×10^6 molecules cm^{-3} and the night-time concentration to be in the range 10^4 to 10^5 molecules cm^{-3} . In addition, the role played by certain VOCs in the formation of ozone is assessed using the POCP (Photochemical Ozone Creation Potential) concept.

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