



Hydroxyl radical observations during the wintertime in Beijing and comparison with photochemical steady state predictions

Lisa Whalley (1,2), Robert Woodward-Massey (1), Eloise Slater (1), Chunxiang Ye (1), Dwayne Heard (1,2), Leigh Crilley (3), Louisa Kramer (3), William Bloss (3), Freya Squires (4), Rachel Dunmore (4), James Lee (4,5)
(1) School of Chemistry, University of Leeds, Leeds, United Kingdom (l.k.whalley@leeds.ac.uk), (2) National Centre for Atmospheric Science, University of Leeds, Leeds, United Kingdom, (3) School of Geography, Earth and Environmental Sciences, University of Birmingham, Birmingham, United Kingdom, (4) Wolfson Atmospheric Chemistry Laboratory, University of York, York, United Kingdom, (5) National Centre for Atmospheric Science, University of York, York, United Kingdom

In Beijing, a megacity of more than 21 million inhabitants, poor urban air quality has a demonstrable effect on human health. During the wintertime, anthropogenic emissions from fossil fuel combustion can lead to high aerosol loadings and frequent haze events. A high oxidation capacity on hazy days has previously been inferred from the significant contribution secondary organic aerosol (SOA) make to total PM_{2.5} (Huang et al., 2014). The hydroxyl radical (OH) mediates virtually all of the oxidative chemistry in the atmosphere, being responsible for the transformation of primary emissions into secondary pollutants such as NO₂, O₃ and SOA. Understanding the sources and sinks of OH in the atmosphere is essential in improving predictions of the lifetimes and chemical processing of pollutants and spatial scales of their transport within urban areas.

We will present OH measurements made in central Beijing during the recent 'An Integrated Study of AIR Pollution PROCesses in Beijing (AIRPRO)' project which took place in November and December 2016. We will compare the OH observations, made over a range of meteorological conditions including a number of haze episodes, to steady state calculations constrained to the total OH reactivity and key OH precursors that were measured alongside. Through this comparison we will identify the major OH sources which sustain the wintertime oxidation capacity.