

## Wang Review

The author's present NMHC data collected from 3 sites in Beijing to characterize the changes in ambient concentrations that occurred as a result of various short term pollution control measures for the 2009 summer Olympics. This is interesting work - how often does a large city perform such an experiment! The authors collected 331 air samples over a period of 3 months. Air samples were collected into fused silica lined canisters which were then analyzed for 55 species using an Entech (a US based company) preconcentration system and separation and detection using GC-MS/FID. The experimental methods are reasonably well described and referenced and the data seem to be of reasonable quality. The authors perform a chemical mass balance analysis on the data to apportion ambient concentrations to particular sources such as vehicle exhaust. The source profiles used in the CMB analysis were determined in previous work performed by these authors. The CMB analysis concludes vehicle exhaust was a significant source of NHMC at all sites contributing 57% to 69% of measured abundance.

The data are reasonably well presented and of wide interest to the atmospheric chemistry community interested in urban air quality. I have no major objections to but do have some minor suggestions for improvement. The Tables and Figures are for the most part clear and informative with the exception of Table 3. I would like a more thorough presentation of the speciated data in tabulated form for the archival literature. These points are detailed in the specific comments below.

### Specific Editorial Comments

1. p 5573 first line; “.. had only 55% of mixing ratios of PKU” is an awkward, unclear statement. Do you mean on average NMHC mixing ratios were 55% lower than those measured at PKU?

It would be useful and desirable from an archival standpoint to tabulate the speciated data (as averages or medians) for the PKU site showing the decrease in mixing ratios for the 3 study periods. Such tables allow for the use of the data in later comparisons by others, as was done in Figure 2.

2. p 5573 line 6. replace “of” with “in” in ... difference in chemical composition...

3. p 5573 line 7. replace “source structures” with “source contributions”.

4. p. 5576. It is stated that traffic counts were obtained for rush hour for 3 different ring roads and values are given in Figure 3a. For which ring road are these traffic counts for?

p. 5577. Emission ratios and Figure 4. It would be better to show the vehicle emissions ratio from the Shao et al. 2009 tunnel study for these species rather than the fits to the data. The data seem quite scattered which would indicate: 1) that other sources contribute to ambient mixing ratios rather than just vehicle exhaust 2) analytical

precision problems or 3) differences in atmospheric lifetime between the plotted pairs. It would be prudent to show species that have very similar lifetimes to highlight the differences between analytical precision and true variability in the data (i.e. hexane vs. 2-methylpentane ; i-butane vs. n-butane, i-pentane vs. n-pentane). Your T-2-butene vs C-2-butene plot Figure 4a shows good correlation and indicates good precision of the measurements and presumably one dominant source since the ratio is invariant. Some explanation of why the ratios are considered constant is warranted given the scatter in Figure 4 since you state "... the ratios are constant ..." between the periods. The figure is useful but I think a stronger argument can be made that the vehicle emissions are a dominant source of many of these VOCs based on correlations, low degree of scatter, and fit to tunnel data.

5. p. 5581. The MIR values used should be noted or at least a reference to the source of MIR values used.

Table 3 is not very informative. The 10<sup>th</sup> and 90<sup>th</sup> percentile ranges for characterizing the similarity of wind direction conditions for the 4 sites is not a good metric in my view. What were the typical conditions?

Table 5. A dividing line between the alkenes and aromatics data would be a useful edit to the table.

Figure 2. Typo in figure caption (b) Propene not Propane? Why are averages being plotted? These data likely have log-normal distributions. Can median values be shown instead?