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Comment

Interactive comment on “Characterization of gas station emissions during the CAREBeijing 2008 field study” by J. Zheng et al.

Anonymous Referee #2

Received and published: 10 July 2011

This paper describes volatile organic compound (VOC) measurements of emissions from gas stations in Beijing, China during 2008 using a PTR-MS instrument in a mobile laboratory. The instruments were positioned just downwind of eight gas stations and the mixing ratios were measured together with the wind speed and direction for about 30 minutes per gas station. About 3–5 plumes were measured during this time period. Using a Gaussian point source dispersion model the emissions of each station were estimated using the available measurements. Total emissions from all gas stations in Beijing were extrapolated from the measurements of the eight stations.

My main problem with this paper is the representativeness of the data. The plume dispersion model that is used here is generally only used for constant point sources, which a gas station is certainly not. Local meteorology and the inhomogeneity of the

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emission source cannot be captured well with the plume dispersion model. This means that there is a very large error, maybe even about an order of magnitude, in each emission estimate for individual plumes. A very small number of individual plumes were measured for each gas station and most of them showed a very variable VOC mixture. There were even plumes that had no VOCs, only NO_x and therefore are likely not caused by the gas stations themselves. It is also hard to image that the measured plumes are always representative of the general emissions. The ambient temperature for example will have a very large effect on the evaporative emissions of the gas stations.

Therefore I think the analysis done in this paper is flawed and far too inaccurate, so that I cannot recommend this paper for publication in ACP.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 14719, 2011.

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