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Interactive comment on “Understanding primary and secondary sources of ambient carbonyl compounds in Beijing using the PMF model” by W. T. Chen et al.

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Received and published: 20 September 2013

This paper investigates the contributions of primary anthropogenic sources and secondary formation to atmospheric carbonyls in Beijing during summer and winter, based on PMF model for source appointment of VOCs measured by the authors. The techniques used for measurements of VOCs and carbonyls are reliable, and the data analysis is logical and comprehensives. This reviewer recommend the paper be published in the Journal after considering the following specifics. It is better to consider the loss of photolysis of carbonyls, especially for formaldehyde and acetone, besides the loss of their reactions with OH. The estimation of photochemical reactions to atmospheric car-

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bonyls might be largely underestimated without considering their loss from photolysis. Page 8 line 175-177, this statement is not correct, because the dominant loss paths for atmospheric formaldehyde and acetone in Beijing are through photolysis, not by the reactions with OH radicals. The three pairs of ratios of the carbonyls to the NMHCs also largely masked the contribution of photochemical reactions to atmospheric formaldehyde and acetone. Page 9 line 201, it is better replaced “produced” by “accompanied”. In addition to the NMHC, the contribution of acetaldehyde degradation is better to be considered, as its fast reaction with OH and it is abundant in the atmosphere of Beijing. The contribution of extremely high reactive NMHCs to atmospheric carbonyls may be underestimated based on the kOH and their concentrations measured, because large fraction of these NMHCs has been lost from their sources to the sampling sites.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 15749, 2013.

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