

Interactive comment on “Vehicular volatile organic compounds (VOCs)-NO_x-CO emissions in a tunnel study in northern China: emission factors, profiles, and source apportionment” by Congbo Song et al.

Anonymous Referee #1

Received and published: 10 July 2018

The manuscript by Song C. et al is a study for primary emission factors (EFs) of vehicular volatile organic compounds (VOCs)-NO_x-CO, and source profiles of vehicular VOCs through a well-designed tunnel test in a megacity of northern China. The fleet-average EFs and source profiles are limited in northern China because of few tunnel studies, which were difficult to organize. In this study, the EFs of VOCs from tailpipe and evaporative emissions resolved by PMF were obtained, which should be the key research highlight. The methods used in this study and corresponding conclusions are much helpful for tunnel tests and also for following researches on source apportionment, evaluation of EFs, emission inventory and control policy assessment.

C1

The paper is well written and structured and is full of high quality data. I suggest that the manuscript can be published after minor revision. Specific comments: (1) In the present manuscript, the paper presented ozone formation potential from fleet-average vehicle emissions. It could be better to further quantify the ozone or SOA formation potential from tailpipe and evaporative VOCs. The break-down knowledge for different sources (tailpipe and evaporative VOC emissions) will provide new insights into useful emission control strategies. (2) The resolved source profiles of tailpipe and evaporative VOCs by PMF should be compared with other published studies. (3) Accurate measurement of the fluxes of inlet and outlet is essential to the calculation of EFs. It would be useful to have a brief description of the methods used to measure the fluxes. (4) Is it possible to resolve tailpipe and evaporative VOCs by the method of chemical mass balance (CMB)? (5) I suggest to conduct the similar study in other seasons with different ranges of ambient temperature.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-387>, 2018.

C2