

Interactive comment on “Contributions of vehicular carbonaceous aerosols to PM_{2.5} in a roadside environment in Hong Kong” by X. H. Hilda Huang et al.

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Comment (2. Experimental 2.1 Sampling equipment and method) Review note to the authors The PM_{2.5} sampler and other instrument in the Mong Kok roadside air quality monitoring station are located on a platform circa 3 meters above the road level of an area with extremely high population density (130,000 person per km²) described as the busiest district in the world (Guinness World Reports).

Response: Thanks for the note on the Mong Kok location. The unique characteristic (i.e., the busiest district) about Mong Kok (the text below) is added to the revised

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manuscript.

“At the Mong Kok Air Quality Monitoring Station, a few aerosol samplers are located on a platform around 3 m above the ground level and instruments for the criteria gas pollutants are hosted in a room at the site with their inlets extending through the ceiling. The real-time ECOC analyzer used in this work is located on the ground with the inlet ~2 m above the ground.”

Comment Line 5 (3. Results and discussions 3.1 Organic and elemental carbon concentrations): the authors state that the annual averages OC and EC concentrations at MK AQMS during the study period were 7.82 and 4.36 $\mu\text{gC}/\text{m}^3$, respectively. The ratio OC/EC = 1.70, while the ratio EC/OC = 0.55. Could the stated values of OC and EC be reversed?

Response: The numbers of 7.82 and 4.36 $\mu\text{gC}/\text{m}^3$ were reported as annual average concentrations of OC and EC, respectively. The OC/EC ratio of 0.5 mentioned in the abstract is the (OC/EC)_{vehicle}, not to confuse with the average ambient OC/EC, which is 1.79 if using the annual average OC and EC concentration data. The (OC/EC)_{vehicle}, was estimated using both minimum OC/EC ratio approach and the dataset from select time periods when diesel-powered vehicles were dominated. In these approaches, the hourly OC and EC concentrations were examined. It is revealed that diesel-powered vehicles emitted a large amount of EC leading to an OC/EC ratio smaller than 1.

Comment The authors state that “higher OC concentrations were recorded during winter months as a result of the contributions of regional air pollutant transport”. Considering that the OC concentrations (Fig. 2) peaked in December, January and February. –while EC concentrations remained relatively constant–, could it also indicate a decrease in photochemical activity during the winter months?

Response: Since high SOA formation is usually linked with strong photochemical activities and during winter months the solar radiations decrease, our view is that the higher

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OC concentrations observed during winter months in this study mainly resulted from the regional transport of air pollutants, some of which could be SOA formed during transport.

Comment Page 77, Line 7: In addition to the stated higher resolution measurements of particle-phase tracer compounds to provide a more accurate estimation of SOA contributions in the urban areas of Hong Kong, the authors should consider the role of single-ring aromatics on SOA formation in their future studies.

Response: We agree with the reviewer's comment that single-ring aromatics (e.g. toluene, benzene, etc.) should be considered for their contributions to the SOA formation since these aromatic VOCs are also an important part of vehicular emissions. However, we note that our work focuses on estimation of carbonaceous PM_{2.5} from vehicular sources, not SOA formation. Hence, we feel elaboration of SOA formation and precursors may not be necessary in this paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 57, 2014.