Reviewer’s report

Title: Modeling Personal Polycyclic Aromatic Hydrocarbon (PAH) Exposure in Human Subjects in Southern California

Version: 1 Date: 18 April 2012

Reviewer: Zhihua (Tina) Fan

Reviewer’s report:

This article aimed to develop a model to estimate personal inhalation exposures to particle PAH based on global positioning system (GPS) time-activity tracking in conjunction with personal particle PAH monitoring data and other data (such as time-activity questionnaire, traffic density, etc.). The approach is useful for assessment of personal exposure to particle-bound PAH and potential health effects associated with such exposure. However, some clarifications are needed prior to consideration for publication.

Major Compulsory Revisions

1. One of the main questions I have is about the sensitivity of the method and accuracy of the measurement. In page 7 and 21, authors indicated the sensitivity of the PAH realtime monitor (PAS) is ~ 10 ng/m3. Based on the results presented in Table 1, most measurements were lower than 10 ng/m3. Please explain how the results may be affected by the large percent of measurements under detection.

2. Some clarifications about the study approach/method are needed. Specifically, why pregnant women were selected for the study? Each subject was measured for 16 hours. Any criteria about when the sampling should be started by each subject? Authors examined several factors that may affect personal PAH exposure as well as correlation between different factors. Rational should be provided for inclusion of those factors for analysis.

3. In page 20, the explanation regarding the difference between the results for 3-5pm and 4-7pm are not convincing. Are there potential differences in sources of PAH between the two time periods?

Minor Essential Revisions

4. In “Abstract” and “Introduction,” please clarify that this study focused on particle total PAH exposure since PAH are semi-volatiles and are present in both gas and particle phases under ambient conditions.

5. In abstract, be specific about “other data”. Also, add implication of the findings of the study.

6. In page 8, 2nd paragraph, were there questionnaires related to the activities, etc. during the monitoring period?

7. In page 9, is it possible that the outliers were due to measurement noise?
8. In page 21, another point should be made, i.e. questionnaire data are still needed since GPS system cannot always indicate the activities of the subject. Also, PAS can't measure gas PAHs. The concentrations of PAH in gas phase is much greater than particle phase.

9. Grammar should be checked.
   a. E.g. page 4, line 4, should be “use” not “uses,”
   b. page 10, replace “indicate that ultrafine..” with “indicated that …” “drop…” with “dropped….”
   c. Page 12, first sentence, add “the” after “analyzed”

10. In page 6, “which can be improved…” in page 6, suggest that authors start a new sentence.

11. In page 6, suggest that move “the target of the present study…” to “Method” or merge it with the 3rd paragraph in page 6.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.