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# ***Interactive comment on* “Sources of humic-like substances in the Pearl River Delta, China: positive matrix factorization analysis of PM<sub>2.5</sub> major components and source markers” by B. Y. Kuang et al.**

## **Anonymous Referee #2**

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This manuscript presents the analysis of HULIS and other air pollutants in the samples collected at the Pearl River Delta (China). The authors provide quantitative analysis of WSOC, OC, HULIS, WISOC, different organic and inorganic tracers in the PM 2.5. PMF analysis was applied to estimate the contribution of different sources to the collected samples. This paper is well written and very interesting. It provides an important information on possible sources (e.g. biomass burning) of HULIS. There are several major and minor comments:

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## Major comments:

1. The author used 1.9 factor to calculate HULIS concentration in  $\mu\text{g C m}^{-3}$  (or HULIS-C). More information is needed how this factor was calculated and why exactly 1.9 was used. Did Lin et al. analyzed similar samples?

2. It's shown that biomass burning is one of the main sources of HULIS in the collected samples. The author also observed high concentration of HULIS during the summer (June), when biomass burning emissions were low. Secondary processes are mentioned as possible sources of HULIS. It's not clear what kind of secondary processes caused HULIS formation at this area. What are possible precursors that could cause high concentration of HULIS during the summer sampling period?

3. Table 1 shows that WISOC fraction is more than half of the total OC. How would the author explain that concentration of WISOC fraction is higher than WSOC, especially when secondary processes were important contributors to HULIS formation (when more oxygenated compounds formed)? More discussions and comparisons with other studies are needed.

## Minor comments:

Abstract. Line 10. For consistency use "K+" and change "sulfate" and "ammonium" on (SO<sub>4</sub><sup>2-</sup> and NH<sub>4</sub><sup>+</sup>) (see 2.2 "Chemical analysis", line 2) Introduction. Line 9. Delete "the pure". SPE does not usually have 100% separation efficiency of organic fraction from inorganic ions.

Introduction. Lines 21-22. Reference is needed.

Aerosol sampling. Line 16. "SASS" abbreviation has to be in brackets. Use "medium volume sampler" not "mid-volume sampler". Line 24. Use comma before "and"

Chemical analysis. Line 13. How the extraction was done? Were the filters soaked or sonicated? What kind of instrument was used to get ultrapure water (company, city, country)? Line 25. Add more information how HULIS were isolated using SPE (how

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cartridges were prepared, how many ml of solvents were used, etc.).

Information on standards is totally missing in the Experimental section (company, city, country).

Brief description of the TD-GC/MS analysis is needed (instrument, column, etc.). What was the efficiency of the TD-GC/MS analysis?

#23922. Line 10. Use “obvious” or “noticeable” not “excellent” before “correlations”

#23927. Line 9. Use reference available for a reader

#23928. Line 19. Use WISOC not “water-insoluble OC” for consistency.

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 23913, 2014.

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