

Interactive comment on “Polar organic tracers in PM_{2.5} aerosols from forests in eastern China” by W. Wang et al.

Anonymous Referee #2

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General comments

The paper reports the concentrations of fifteen polar organic compounds in fifty PM_{2.5} aerosols collected at four forest sites in China. The 15 polar organic compounds include 4 secondary organic aerosol (SOA) tracers for isoprene, 3 SOA tracers for a-pinene, 6 sugars/sugar alcohols, and 2 hydroxy dicarboxylic acids (i.e., malic acid and 2-hydroxyglutaric acid). Isoprene and a-pinene SOA tracer abundance measurements have not been previously reported for forest sites in China. This work provides useful data in our efforts to understand the SOA contributions by isoprene and a-pinene in China. However, the interpretation of data is weak. The work is more of a survey type, leaving readers the impression that the quantification of a handful of tracers was the only contribution of this work to the literature.

Specific comments

1. Abstract: The authors need to be more specific in describing their major findings of the work. For example, the statement “Results indicate that the concentration trends of the secondary organic compounds reflected those of the trace gases and meteorological parameters” is a rather general statement. Readers, this reviewer for one, do not get a clear idea of this work’s major findings or contribution to science by reading such a statement stripped of content. Another example: “The 24-h average concentrations of isoprene oxidation products, *α*-pinene oxidation products, sugars and sugar alcohols vary systematically along gradients of ecological succession”. The authors need to explain what “vary systematically along gradients of ecological succession” mean.

2. Abstract, line 4: “time trends” should be removed, since the time trend data reported in this work consists of only 15 samples spanning 7 days (20-27 Nov.) in Hainan. Such a limited sample size could hardly yield a meaningful interpretation of temporal trend.

3. The sentence from Lines 19-23: The studies cited in this sentence, with the exception of the study by Wang et al (2007), are all about major constituents of PM2.5 aerosols (i.e., inorganic ions, EC, and OC). They are not about “chemical compositions of PM2.5 **organic** aerosols”, as the authors stated. Here it is more appropriate for the authors to make references to a few studies that report chemical characterization of organic aerosols in China (e.g., Wang et al., 2005, EST, v39, 7430; Zheng et al., 2005, AE, V39, 3967; Yang et al., 2005, AE, v39, 3735; Feng et al., 2006, Chemosphere, v64, 1393; He et al., 2006, Sci. Total Environ., v359, 167; Ho et al., 2007, JGR, v112, D22S27;).

4. Page 12442, lines 13-15: “A diel variation of the 2-methyltetrols with highest concentration during day-time was found for all four study sites (Table 1).” Only three sites have both day and night samples. Therefore it is incorrect to say “all four study sites”. And Table 1 only shows the data for Changbai site.

5. The correlation of SO₂ with isoprene oxidation product in the five samples collected

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at Changbai site was showed in Figure 2 to support the suggestion that sulfuric acid plays a crucial role in the formation of 2-methyltetrols. Was there a similar correlation in the four samples collected in Chongming, Shanghai? If yes, the suggested link is strengthened. If not, this may indicate that the observed correlation at Changbai might be fortuitous. In either case, there needs to be a discussion of the correlation of SO₂ with isoprene SOA tracers at Chongming.

6. Conclusion: The authors stated “It can be concluded that all biogenic tracer compounds contribute significantly to the OC in both Hainan and Changbai”. “contribute significantly to OC” is an over-statement, considering the contributions were less than 1 %.

Minor comments

1. Page 12442, line 1: Replace “Table 1” with “Tables 1-4”.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 12435, 2008.

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